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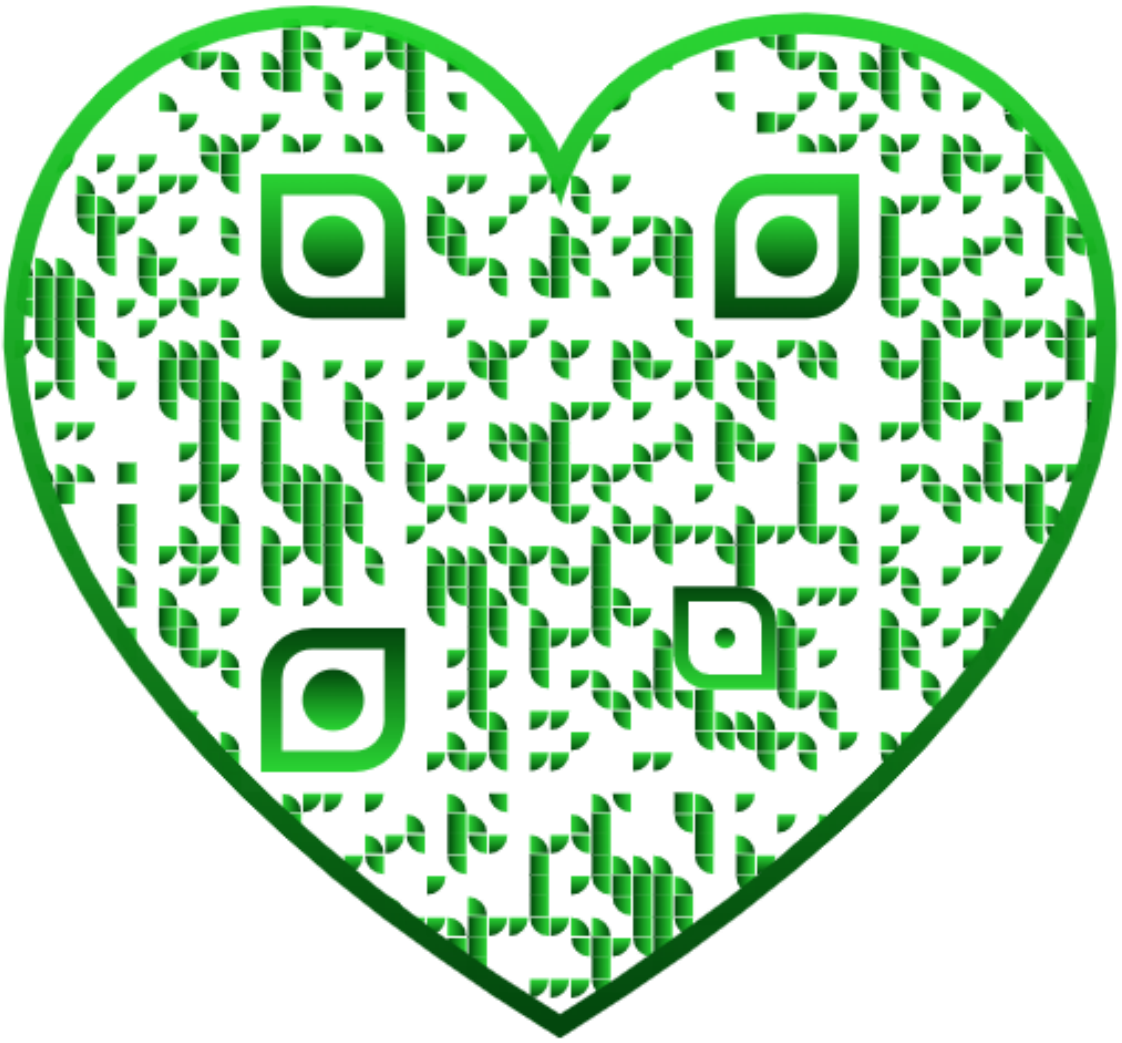


MAGICO

AS WE SEE IT

BY JIM AUSTIN

THIS ISSUE: Is everything we thought we knew about moving coil phono cartridge loading wrong?

Dispelling a myth(?) about phono-cartridge loading

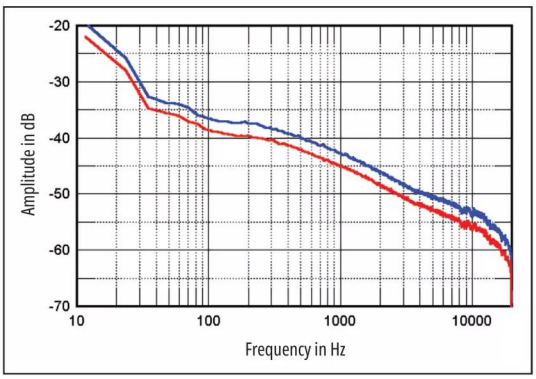
In the midst of his December Gramophone Dreams column, Herb Reichert presented the results of an experiment. He was listening to the most recent version of Zu Audio's Denon DL-103, installed on his new-old Lenco. He hooked it up to the moving coil input of his SunValley SV-EQ1616D's phono preamp, which apparently is intended for use with low-output MC cartridges since it loads them down with a 50 ohm shunt resistor—a heavy load for all but the lowest-impedance MCs. The rough rule of thumb for loading an MC cartridge, as many readers are aware, is that the load resistance should exceed the cartridge's internal impedance by about a factor of 10.

As MC cartridges go, the DL-103 has a *high* source impedance, around 40 ohms—almost equal to the load impedance imposed by the SunValley phono pre. The result—loading at nearly 1:1—is very unconventional!

So, Editor Jim, doing his editorial due diligence, started asking questions. He found himself involved in a three-way conversation, with Herb plus Dave Slagle, proprietor of Intact Audio and partner in EMIA. Herb brought to my attention a 1980 article by J. Peter Moncrieff, published in *International Audio Review #5*. Moncrieff started by noting the "common speculation in the audio community that a moderately low-value resistor ... damps the high-frequency peaks which most moving coil cartridges exhibit in their frequency response." Yep, that's what I thought. While admitting that it's plausible, Moncrieff concludes, "in this case it turns out that common speculation is substantially untrue." He presents measurements of cartridge response as a function of loading from 100 ohms down to 5 ohms, with no change in frequency response.

Slagle became involved in our conversation because, as Herb already knew, he has independently corroborated Moncrieff's result. Both Moncrieff's and Slagle's work—and Herb's subjective observations—support the idea that what I have long taken to be conventional wisdom about MC cartridge loading—described by Moncrieff in the paragraph above—is wrong.

It is true that, when viewed as purely electrical circuits, MC cartridges have a resonant peak. Physics provides a simple formula for predicting the resonance of an electrical system. By plugging in typical values of inductance and capacitance for an MC cartridge, we find a resonant frequency not in the treble but in the low MHz range. (A mechanical resonance in the near-ultrasonic range has been hypothesized for a stylus moving in a record groove—the so-called stylus groove resonance—but assuming it exists, loading down the cartridge with resistance will not dampen it.)



Such values are so far above the audible range that even if they were real, damping them is unlikely to have any direct effect on the audible-range frequency response. But it doesn't matter: A phono cartridge is an electromechanical system, not just electrical. It isn't possible to vibrate a phono cartridge at MHz frequencies. Any electrical resonance will be mechanically damped.

The behavior in the audible range is easily tested. I had an Ortofon Windfeld Ti MC cartridge set up on my turntable. The Windfeld is a low-output MC cartridge with a low source resistance: 7 ohms. In my system, the Windfeld was feeding a Pass Laboratories XP-27 phono preamplifier, which has a range of passive loading from 30 ohms to 47k ohms. I connected the phono preamp's output to my Focusrite Scarlett 2i2 audio interface and connected that by USB to my Macintosh laptop. I played the pink noise track from the *Analogue Productions Ultimate Analogue Test LP* and recorded it at a sampling rate of 96kHz using Adobe Audition. I did this twice, first with the load resistance set to 47k ohms, then with it set to 30 ohms. I repeated the measurement with a few different values of capacitive load to confirm that this wouldn't affect the result. (It didn't.)

You can see the results in the figure. In the audible range, the only effect of heavier loading (lower R) is a slight reduction in cartridge output. Over the range measured, the frequency response is unchanged.

Yet anyone with ears can hear that loading down an MC cartridge does *something*. If it doesn't affect the frequency response, what *does* it do? Moncrieff suggested that proper loading reduces distortion—especially intermodulation distortion—perhaps by reducing the tendency of the stylus to flit about inside the record groove. Makes sense to me.

Where did the conventional wisdom come from? Perhaps it was helped along by the fact that it's qualitatively correct: There is indeed a high-frequency electrical resonance, and a resistive load can dampen it. It's just that the peak is too high in frequency to matter. A second source of confusion may be the use of step-up transformers (SUTs). Just as a transformer reduces the effective load resistance by an amount equal to the turns ratio squared, a SUT *multiplies* cartridge capacitance by the same amount. That's enough to bring the resonant frequency much closer to the audible range.

I find results like this exciting—it's fun to be freed up from convention. If one accepts this result, then it's time to rethink the whole subject of MC cartridge loading. Does an optimal value of the load resistance exist at all? Moncrieff says no—that there is no lower limit: The lower the load resistance, the better.

I was unaware of any of this until a few weeks ago—yet Moncrieff did his work 43 years ago. Has anyone since then solved the mystery of MC cartridge loading? If you know the answer, drop me a line. My email address is on the magazine's masthead. ■

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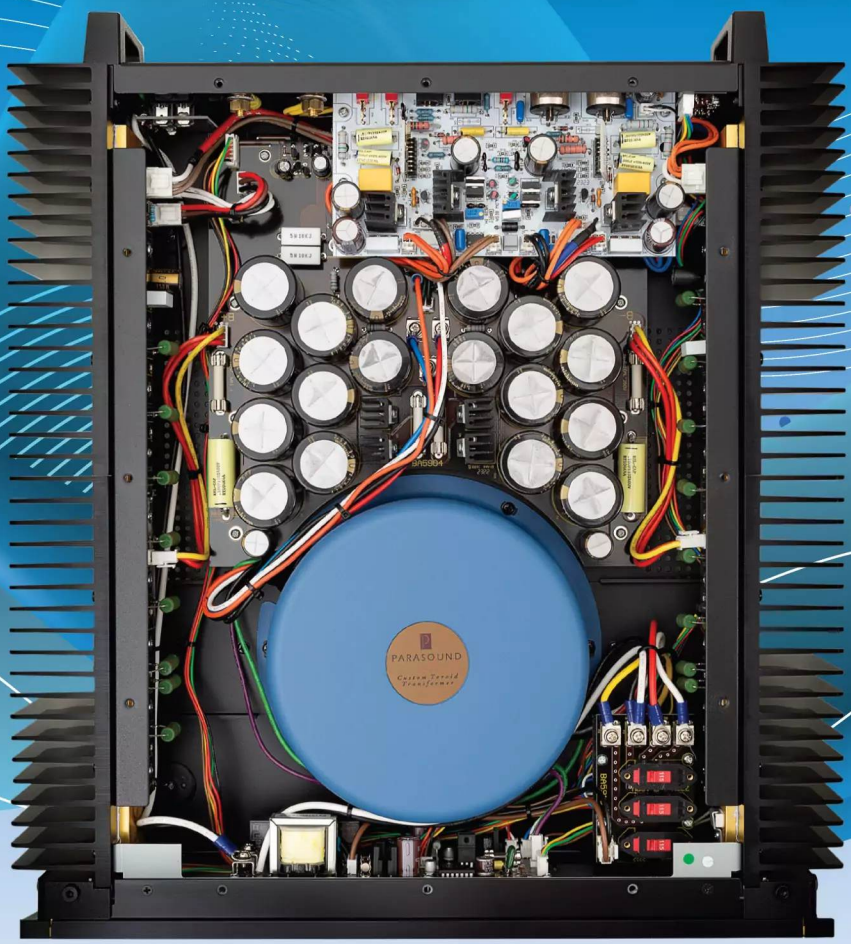

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LETTERS FEEDBACK TO THE EDITOR

TAKE HEED! Unless marked otherwise, all letters to the magazine and its writers are assumed to be for possible publication. Please include your name and physical address. We reserve the right to edit for length and content.

Tink Walks Amok

The Frank Zappa album *The Man from Utopia* includes the track "Tink Walks Amok," which is an athletic study in syncopation and polyrhythms. It's a cool track.

I've owned the LP since its initial release in 1983 and heard it first on my elder brothers' pretty good stereos and since then on my own, much better systems. I spin it now on a VPI Prime/Ortofon rig via a tubed phono stage.

I noticed the album up on Qobuz, so I took the easy way out and streamed it instead of finding and cleaning my LP. Soon I noticed something different: What on LP had always been (and still was on the Prime) a bit of slightly murky-phasey cymbal work centered in the soundstage was now a wide-open presentation of cymbals nestled in deep reverb and with all spatial detail intact.

I could not find any documentation of an alternative mix ever being made, so all I could figure was that the much better channel separation of the digital source was allowing this cymbal work to come through in clear focus. Never before nor since have I noticed such an obvious difference between analog and digital versions of the same music.

I'm not looking to unearth the tired bones of the analog-vs-digital debate, but I cannot come up with another plausible explanation for the digital version's clearly superior reproduction of these cymbals other than the far better channel separation.

Adam C. Renz
Defiance, Missouri

Mr. Renz, The Man from Utopia *was remixed and resequenced (with a bonus track) for the 1993 CD release on Barking Pumpkin Records. Assuming (as is likely) you have original all-analog vinyl and not the digitally remastered vinyl from 1986, this will account for the difference you heard.*—**Jim Austin**

LPs, attics, and those old Polks

In 1978, on a whim, I gave my friend a free gift: 60 LPs that I rarely listened to (As We See It, September 2023, p.3). In 1981, my roommate and I decided to move out of our apartment, and we had two very large, heavy boxes of adult magazines. On a whim, we left them up in the attic. My box contained over 200 Playboys, every issue from 1964 to 1981, and a dozen older ones back to the 1950s—a free gift to whoever found them. Imagine the surprise that guy had opening that box!

I only listen to headphones—imagine Colonel Kurtz yelling down the street "Stellia! Stellia!"—but on a whim, I decided to listen to my Polk Euro Towers and removed the grilles, only to find cat vomit running all the way down one of them. About three years before that, my cat, who likes to sit atop them, had puked, and I cleaned the grille but did not realize it was on the inside, too. Those old Polks cleaned up nice and still sound fine. Polk 1, Vomit 0.

Greg Sowle
Sun City, California

PS: My cat got a text from your dog, where he said that during your walk down Riverside Drive, he would rather have heard David instead of the Duke. As in, "She'll Drive the Big Car" and "Fall Dog Bombs the Moon."

"Why Not Listen to Everything?"

At last! Someone besides me realizes that there is more to listen to in life than recorded music (My Back Pages, June 2023, p.146). Sadly (in my opinion), music has become the ubiquitous backdrop to life, as opposed to being something very special, like it used to be back in the day. I remember modifying a crappy fold-down turntable in the very early 1970s with $^1/_4$" jacks to the left and right channels so I could connect those channels to Guild and Silvertone amplifiers to get improved (not to mention louder) playback. I wired up a Silvertone 2" × 12" cabinet to the 8-track stereo in my 1966 Chevy Corvair to get better (ie, louder) sound. Oh, to hear those Grand Funk Railroad records at good playback volume!

I've been an active, semipro electric bassist for 45+ years and counting. When I have long drives to playing gigs and such, if I am not listening to NPR, I am listening to the sound of my own wheels spinning—that or the sounds of real life! Is it better than listening to Return to Forever, Weather Report, Earth, Wind & Fire, or Stone Temple Pilots? No! But many days, the sounds of real life are simply more enjoyable to listen to than recorded music. Do I expect everyone to buy into this? Absolutely not! But it is something that I have been doing (and enjoying) for a few years now. Thank you, Casey, for making me feel that I am not completely losing my mind.

Patrick B.
Milford, Connecticut

The Curse of Composition

I enjoyed Thomas Conrad's excellent article "The Curse of Composition" (September 2023, p.115), where he discusses whether some jazz musicians should be paying greater tribute to songwriters of the past rather than largely to their own compositions. Young musicians *should* write and publish their own works if desirous to do so. But as Conrad points out, this can be creatively balanced with inclusion and coverage of the great composers of the past. It is this past, foundational reservoir we must never lose, while still encouraging jazz musicians to compose their own works as they wish. One of the key components (perhaps the key component) of jazz is improvisation. For me, this is what sets jazz apart from other music forms—and this spontaneity or creative interpretation has traditionally been based on great compositional resources such as the American Songbook. Hopefully, musicians will maintain the balance of creating their own compositions while paying tribute to great past composers.

Jonathan Horwich
Chicago, Illinois

Thomas Conrad's "The Curse of Composition" is a welcome take on an issue that, as he says, has been largely ignored. The field of jazz standards can always be enlarged. One test of a new composition is whether other jazz musicians find it to be worthy of further interpretation. Many of the new compositions that fill so many young jazz musicians' albums these days—and for the past few decades, as Conrad notes—have not met that test.

Geoff Mirelowitz
Seattle, Washington

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INDUSTRY UPDATE

AUDIO NEWS & VIEWS

SUBMISSIONS: Those promoting audio-related seminars, shows, and meetings should email the when, where, and who to stletters@stereophile.com at least eight weeks before the month of the event. The deadline for the April 2024 issue is January 20, 2024.

RECALIBRATION: MAGNETIC REFERENCE LAB ANNOUNCES IMPENDING SHUTDOWN

Tom Fine

Everyone who buys anything made from magnetic tapes, be it all-analog LPs, reissues of recordings made prior to relatively recent history, or digital transfers from analog tapes, should worry when the main maker of playback-calibration standards for all tape machines closes its doors. Without standardized calibration tapes, which were used to align the machines on which master tapes were recorded, it isn't possible to get accurate playback, whether it's to a lacquer disc or a digital file. What's more, technicians who restore and repair tape machines use calibration tapes in the machine's final setup to adjust playback-head azimuth and fine-tune it to correctly track the desired equalization curve.[1]

At the beginning of October, this text appeared at the website of Magnetic Reference Lab (MRL), the last widely accepted professional manufacturer of calibration tapes: "After nearly 50 years in business, we are sad to announce MRL will be closing at the end of this year (2023). Over the past decade, we have done our best to continue supplying a quality product, but time has finally caught up with our personnel and equipment."

The "personnel" at MRL is Chuck Booye, who has run it as a one-man shop for the past 15 years. His stepfather, Tony Bardakos, cofounded MRL in 1972 with Ed Seaman and John G. "Jay" McKnight. All were former Ampex employees. McKnight, who became CEO in 1975, died in 2022. According to Booye, McKnight's heirs own the

company and support his decision to close.[2]

The bottom line, Booye said, is that the equipment is old and worn out. His service technician retired earlier this year. "Every day, my fingers are crossed," he said. "I don't know what's going to happen until I turn a machine on. I have no idea what's going to go wrong and when it's going to go wrong." On the plus side, he said, he's had so many malfunctions and breakdowns by now he knows how to troubleshoot quickly.

MRL's plant, Booye said, is comprised of two highly customized Studer A80 tape machines—one that produces 1/4" and 1/2" alignment tapes and another that makes 1" and 2" tapes—and a rack of electronics to control the machines, generate alignment tones, run digital sound loops of announcements introducing the tapes and specifying which tones follow, and perform various quality-control functions. The system is run by a 1990s-vintage 386-based PC, with customized machine-control functions programmed in the obscure language Forth. The Studer machines have stock motors and cabinets, but just about everything else is custom made, dating from the 1970s. Booye said the circuits are full of out-of-production ICs and unreliable, aged-out parts.

Howard Sanner, founder and owner of the Ampex List online community for tape machine experts and enthusiasts, recalls visiting McKnight (a long-time member of the community) at MRL in 1996. "It was quite something to see a tape being made: The only manual [labor involved was] threading the tape and removing it from the machine when finished. Otherwise, you just typed the [catalog] number into the computer, which told the Studer what to do, including getting that nifty tape [editing knife], that always reminds me of 'Thing' on the old *The Addams Family* TV show, to pop up and cut the tape" at the end of the reel.

Could someone come along and buy the company? "As of today," Booye said, "MRL is not for sale." He added: "If someone were to buy the equipment, there's no guarantee it will work. ... We may just end up selling off the machines."

Lately he's been limping the plant through its final flurry of orders. In recent

1 See mrltapes.com/caltape.html.

2 Jay McKnight was a giant in the professional audio world. See en.wikipedia.org/wiki/John_G._McKnight and MRL's website (mrltapes.com) for a wealth of information about magnetic recording and proper alignment of tape machines.

CALENDAR OF INDUSTRY EVENTS

ATTENTION ALL AUDIO SOCIETIES: We have a page on the *Stereophile* website devoted to you: stereophile.com/audiophile-societies. If you'd like to have your audio-society information posted on the site, email Chris Vogel at vgl@cfl.rr.com. (Please note the new email address.)

It is inappropriate for a retailer to promote a new product line in "Calendar" unless it is associated with a seminar or similar event.

CALIFORNIA

■ Friday evenings, 5–7pm PST: The San Francisco Audiophile Society hosts a virtual happy hour via Zoom. This is open to anyone who'd like to join us to talk about hi-fi and whatever else is on your mind. For more information and registration, visit bit.ly/3RyaqX9.

FLORIDA

■ February 16–18, 2024: The Florida Audio Expo will take place at the Embassy Suites by Hilton Tampa Westshore, 555 N. Westshore Blvd., Tampa, FL 33609. For more information, see floridaaudioexpo.com/contact-us/.

TEXAS

■ March 15–17, 2024: A new show from the team behind the Capital Audiofest and Pacific Audio Fest will take place at the Anatole/Hilton in Dallas. For more information, see southwestaudiofest.com or contact Gary Gill or Lou Hinkley at capitalaudiofest@gmail.com or lou@pacificaudiofest.com.

years, typical monthly revenue was about $8000. Last month, it was $54,000. Booye said he'll accept orders until December 29, assuming his equipment continues to function. The world's largest archiving and tape-transfer company recently placed an order for 100 tapes of various widths and formats. He told them, "I can't guarantee this order will be filled, but I will try."

Professional calibration tapes have been produced for nearly as long as professional tape machines. In the 1950s, Ampex and Audio Devices began producing tapes to the National Association of Broadcasters (NAB, now IEC2) playback EQ curve. In Europe, the CCIR (now IEC) curve was standard, and BASF was the leader in calibration tapes. Ampex continued making calibration tapes until the early 1970s. The man who developed many of their processes, Robert Morrison, left Ampex in the late 1960s to form Standard Tape Lab (STL), competing against his old company. MRL started after Bardakos and McKnight were laid off from Ampex; Bardakos had been running the calibration-tape business. STL went out of business decades ago, and BASF, while otherwise still in business, stopped making tapes in or around 1997.[3]

As of now, a small outfit in Europe claims to make calibration tapes but has had little penetration in the professional audio world. Booye said—and it's spelled out in several *Journal of the Audio Engineering Society* papers by Morrison and McKnight—that making calibration tapes is a precise, finicky business. It's very difficult to build and maintain a tape machine capable of recording and reproducing perfect mirror images of an EQ curve.

MQA IS NOW WAVE REALISATIONS LIMITED

Jim Austin

In a filing at Companies House, MQA, which as we previously reported is now owned by The Lenbrook Group, parent company of PSB Speakers, NAD Electronics, and Bluesound, has changed its name. Henceforth, MQA Limited will be known as Wave Realisations Limited.

MQA filed for the name change September 23, 2023, and was granted a "Certificate of Incorporation on Change of Name" exactly a month later. Wave Realisations Limited lists two active officers: Michael John Jbara and MQA cofounder John Robert (Bob) Stuart.

In response to an email query, Stuart offered this comment: "This is simply a name change of the old company. It has no bearing on the technology or forward path."

SALK SOUND CLOSES

Julie Mullins

The home page of Michigan-based loudspeaker manufacturer Salk Sound recently presented this announcement: "As of September 15, 2023, Salk Sound is no longer accepting orders for new speakers. We have sold our woodworking equipment and no longer have a shop. So we are unable to build new speakers or repair old ones. Thanks to all of our customers and supporters. For over 20 years, we have enjoyed delivering world-class speakers to customers around the world. Our plan is to maintain this web site for archival purposes."

Is it really the end of the line? Perhaps not. The statement went on to tease, "we have a few ideas on what Salk Sound will entail in the coming months and years. So stay tuned." Curiosity compelled me to call and find out more.

Owner/custom speaker builder Jim Salk confirmed they'd closed their shop in Lake Orion, Michigan, but there's more to the story. "About five years ago, I decided I'd do this until I was 75," Salk said in a recent phone conversation. "I just figured that you can only do it for so long, and 75 seemed

3 See basf.com/global/en/who-we-are/history/chronology.html.

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The pandemic didn't help. People staying home more wanted to improve their homes, including their hi-fi systems. Orders spiked, but the supply chain broke down: "Every day, you couldn't get a certain part." Costs for parts and shipping—if you could manage to move the goods—skyrocketed. Demand outstripped supply. "We had agreed to the orders at given [prepandemic] prices, so there went our [profit] margins. It wasn't as much fun as it used to be, put it that way."

Eventually the situation stabilized, and they continued business for a while. Salk set a cut-off date for orders—March 2023—to ensure the orders could be fulfilled prior to their planned September closing. "Fortunately, we have a very, very loyal customer base," Salk said. "We didn't have any trouble with orders.

"We went out on top of our game. Everybody was happy."

What about those future plans, hinted at earlier? Jim shared some initial plans and ideas for what's next, though details are still being worked out. Among the possibilities: speaker-building how-to videos and DIY kits. "I learned a lot in 22 years," he said. "I thought I'd do videos on how to build cabinets, how to build speakers, ... all kinds of tips I could pass on to everyone else."

A lot of people helped him along the way, he told me: "If I can pass along that knowledge, I could be paying it forward."

For more information, keep checking Salk Sound's website (salksound.com) and follow Salk Sound on social media.

HI-FI DISTRIBUTOR MIBS DISTRO NA ADDS SAT

Julie Mullins

MIBS Distro NA announced in a recent joint press release that they've added luxury-priced analog brand SAT, also known as Swedish Analog Technologies AB—which, after a move from Sweden to Spain, now operates as Analog Solutions SL.[4] Based in Fuerteventura in the Canary Islands, under designer Marc Gomez, the SAT marque is best known for its expensive tonearms, one of which—in two lengths—is the only tonearm in Class A+ of *Stereophile*'s Recommended Components list, at €50,000 for the 9" version, €60,000 for the 12". The SAT turntable—the XD1, which costs €180,000 without a tonearm—is also in Class A+.

MIBS Distro NA will serve as SAT's North American distributor, in addition to providing marketing and brand-management services. MIBS Distro operates in partnership with Jonathan Badov of Sonic Artistry, a dealership based in Toronto, Canada.

SONUS FABER GOES WIRELESS WITH DUETTO

Julie Mullins

Italian loudspeaker manufacturer Sonus Faber recently introduced the Duetto, an active, wireless speaker system. It's the company's second-ever active wireless model, following the single-box Omnia all-in-one Rogier van Bakel reviewed in these pages in 2022.[5]

Sold in pairs, the two-way Duetto is a bass-reflex design with a rear port and a custom heatsink integrated within its slightly curved form factor. The wood cabinet, which comes in lighter and darker

finishes, houses two amplifiers: A 100W class-AB amp to power the silk-dome tweeter and a 250W class-D amp to drive the 5.25" long-throw midwoofer, which uses a paper-pulp diaphragm and a neodymium magnet. The driver uses Sonus Faber's "Organic" basket, which, the company says, "prevents resonances and eases the air flow production by the long excursion of the driver."

Like other Sonus Faber speakers, the Duetto sports a leather top. Here, though, it is an "interface leather top SENSO," which allows manual control of volume, input selection, and connection choice. There's also a Sonus Faber app for control and system setup.

Connections include a pair (L, R) of analog inputs on RCA and digital inputs over optical (TosLink) and HDMI ARC/eARC connections—the latter for TV/home theater setups. There's also a single subwoofer output.

The Duetto's connectivity obviously makes it suited for those who enjoy streaming music. But what's even more interesting is its record-playing potential. The analog input toggles between phono and line level, and there's a ground screw for connecting a turntable.

The spec sheet lists two well-known DAC manufacturers, AKM and Sabre, though it doesn't say which chips are used or exactly how. Apple AirPlay and Google Chromecast playback are supported, as are streaming options including the usual services: Spotify, Qobuz, and Tidal Connect. It's also Roon Ready, according to the press release. Bluetooth is offered—specifically Qualcomm's aptX HD—and the speaker is Wi-Fi Certified. For wireless interspeaker connection, Duetto deploys UWB (Ultra Wide Band) radio technology with radio modules provided by Sparks Microsystems, which is reported to "avoid latency and interference," the company says.

The Duetto speakers are in market now for $3999/pair. Stands are available for the bookshelf-size Duetto speakers, sold separately for an additional $749/pair.

4 Analog Solutions SL is not to be confused with the British analog synthesizer manufacturer or the Boulder, Colorado–based electronics consultancy.

5 See stereophile.com/content/sonus-faber-omnia-wireless-loudspeaker.

CAMBRIDGE AUDIO ADDS NEW BLACK EDITION ALONGSIDE LUNA GREY

Tom Fine

UK-based Cambridge Audio has released Black Editions of its MXN10 network player and DacMagic 200M DAC. The compact, half-width units were previously available in "Luna Grey."

"The black-on-black style is a perfect match for the timeless minimalist design of MXN10 and DacMagic 200M," Cambridge Audio CEO Stuart George told *Stereophile*. "We had overwhelming demand for the CX-Series Black Edition, and I'm delighted to introduce more to the Cambridge family." A press release described the styling as "combin(ing) a stylish aluminum front plate in a matte black finish with shimmering black gloss spot lettering. The dual texture effect means both components stand out even from standard black separates."

The MXN10, introduced in February 2023 and priced at $499, has inputs for Ethernet, Wi-Fi, Bluetooth 5.0, Apple AirPlay, Google Chromecast, and a USB socket. Digital output is via coaxial or optical S/PDIF, and there is a built-in DAC with RCA analog outputs. The MXN10 can be controlled with Cambridge Audio's StreamMagic streaming app. Built-in streaming services include Qobuz, Tidal, Spotify Connect, and internet radio using MPEG-DASH.

The $549 DacMagic 200M debuted in 2021. It features dual-ESS SABRE ES9028Q2M chips, one per channel, and accepts digital audio up to 24/768 and DSD512; the highest resolutions are only available through the USB input. There's Qualcomm aptX Bluetooth for wireless. Digital inputs include two pairs of dual optical/coaxial terminals and USB 2.0. It has a built-in headphone amp, and the line output is available balanced via XLR connectors and unbalanced through RCA sockets.

B.AUDIO RELEASES ALPHA ONE ALL-IN-ONE

Julie Mullins

B.audio is a relatively new hi-fi maker, founded in 2016 by two brothers—both engineers with R&D experience who apply their own, modern approaches to technical design—based in eastern France in St. Hippolyte. Their products include DACs, preamplifiers, amplifiers, and combinations of those with networked streamers/servers.

Their latest release is the Alpha One streaming integrated amplifier. The Alpha One has everything you need to make music, except a music-data source (server, streamer, or transport) and a pair of loudspeakers. It combines their multibit sigma-delta DAC with "a high-end passively cooled dual-mono amplifier," the company's website says. The class-AB amp is a balanced design and outputs 120W into 8 ohms, 200W into 4 ohms. It includes B.audio's proprietary EX network module for streaming; it's a Roon-certified end point. It supports Qobuz, Tidal, and Spotify streaming services plus Apple's AirPlay for wireless connectivity. One aspect of the Alpha One not found in most streaming integrated amps is built-in room correction software.

Patented "SJR"—for "source jitter removal"—is said to, um, reduce jitter. Volume control is analog, with a 64-step, relay-driven resistor network.

Connectivity includes two pairs of RCA and a single pair of balanced XLR inputs plus a pair of XLR preamp/bypass outputs. The streaming input is Ethernet (RJ45). Digital inputs include two TosLink, AES3, USB Type B (for digital input), and S/PDIF. There's also a USB Type A input for connecting storage media. The unit ships with a matching remote control.

B.audio designs its own electronics and mechanical parts in-house and works with local suppliers to produce them. Their in-house team develops the software used in their components, which are made to be upgradeable. The Alpha One is in market now and sells for $17,000 MSRP. B.audio is distributed in the US by Englewood, Colorado–based Monarch Systems Ltd.

MOONRIVER AUDIO'S NEW SWEDISH PHONO MULTI-TOOL

Tom Fine

Moonriver Audio, based in Malmo, Sweden, has released its new model 505 "Hybrid Stereo Phono EQ Stage"; it's "hybrid" in the sense that it uses both integrated circuits and discrete transistors to boost the output of both MC and MM cartridges, with passive de-emphasis EQ.

The company's website says the 505 was "designed with audiophiles, record collectors, and vinyl freaks in mind." Priced at €4990 (about $5275 at press time), the 505 includes four phono inputs (one balanced via XLR, three unbalanced via RCA) and both balanced (XLR) and unbalanced (RCA) outputs.

Each phono input can be adjusted independently for gain and loading via the four knobs and five switches on the front panel. The "microcontroller" interface remembers the most recent setting for each input, and changes can be made on the fly, while listening to records. The company notes that the front-panel controls allow

for "12 gain settings (six for MM and six for MC), five MM capacitance settings, five MC load settings (including a custom option), three MM load settings, and EQ choice for RIAA, Decca, or Columbia 78 rpm records." There is also a mono/stereo switch on the front panel.

Inside, circuit boards are stuffed and soldered in Sweden from a global supply chain. According to Moonriver, "the layout is mainly based on discrete, through-hole components except the input for MM and MC stages with their impedance and capacitance adjustments which are using surface-mount components to keep the signal path as short as possible." Individual parts are hand-selected, said chief engineer

George Polychronidis.

According to the 505's specifications, gain is 34dB on the lowest setting, 72dB on the highest setting. Load capacitance can be set to 100, 220, 330, 470, or 680pF. MC load resistance choices are 10, 47, 100, 470, 1k ohm, and "custom." Even MM load resistance is adjustable; the choices are 22k, 47k, and 75k ohm.

Moonriver is distributed in North America by On A Higher Note in San Juan Capistrano, California.

AUDIO ELEMENT

Jim Austin

In our November issue, Julie Mullins reported on two SoCal audio dealers who recently opened new showrooms. One of them—Pasadena-based Audio Element—opened a new facility in Carlsbad, just north of San Diego. The grand opening took place the same day they celebrated the 10th anniversary of the Pasadena store.

After that article was published, I got a call from Jen and Brian Berdan, Audio Element's proprietors. They felt we had gotten some things wrong. I told them we'd set the record straight.

One concern was our statement that the flagship Pasadena store "focuses on entry-level gear." In fact, Audio Element Pasadena is a full-range dealer, offering high-end gear from Boulder, Cardas, Clearaudio, Dan D'Agostino, dCS, Grand Prix Audio, Transparent, and Wilson Audio Specialties, among other brands. What they intended to communicate is that in addition to high-end sales, they also offer high-value packages intended to meet price points.

Our article said that the new store has two listening rooms and a warehouse space, but that warehouse is also a listening space—it's now a lounge/game room with several setups.

Audio Element's Pasadena store is located at 117 E. Union Street. The Carlsbad store is at 5235 Avenida Encinas, Ste #A. We wish them the best of luck at both their old and new locations. ■

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GRAMOPHONE DREAMS

BY HERB REICHERT

THIS ISSUE: A new phono stage from MoFi Electronics offers gain and loading versatility and multiple inputs including transimpedance and voltage drive.

The MasterPhono from Mobile Fidelity Electronics

During my cub reporter days at *Stereophile*, I was always on the lookout, casting about for midlevel analog components I might latch on to, ones that could join my long-term daily-driver reference system by complementing the character of my midlevel DeVore Fidelity Orangutan O/93 and Falcon LS3/5a loudspeakers. I was searching for these basic traits: alive and vigorous, clear and well-sorted, relaxed and natural. One of my first-ever *Stereophile* reviews, in the October 2014 issue, was of Sentec's EQ11 phono preamplifier, which featured six EQ choices, selectable from the front panel, Bakelite knobs, Switchcraft switches, and a gray Hammerite-paint finish.

When I reviewed the Sentec, I owned three turntables and about 300 records. But phono stage–wise, I was a beggar and a borrower, hoping a friend's phono pre or some review product would jump out of the deck and become my reference. The Sentec was relaxed and natural sounding and fun to use, but it wasn't sharp, vigorous, or well-sorted. Unsatisfied, I kept my search going until the summer of 2016 when Art Dudley suggested I try Tavish Design's six-tube Adagio phono stage, which he had just reviewed in Listening #162.[1]

With permission from Tavish founder and engineer Scott Reynolds, Art passed his Adagio review sample along to me. Right away, I liked its pro-style black faceplate and gray, painted-steel chassis. Its sound was balanced, not excessively tubey, and satisfying on every level I care about. But it was the Adagio's ability to let me connect two turntables and quickly and easily set all cartridge and amplifier operating parameters with faceplate-mounted switches that caused it to stay in my system for seven years and counting. That's a millennium in reviewer time.

In my mind, this "everything is front-panel adjustable" feature made phono preamps with hidden DIP-switches seem tourist-class. The Adagio introduced me to business class.

I first spotted Mobile Fidelity Electronics's $5999 MasterPhono MM/MC phono stage at AXPONA 2023. As intended, the red-orange lights on its VU meters caught my attention. So did its wood side panels—but it was the MasterPhono's extensive front-panel-adjustability I was thinking about when I requested a review sample.

The MasterPhono measures 17" × 3.5" × 15.75" and weighs 15lb. On the front, one knob selects Gain: 40dB, 50dB, 60dB, or 70dB. The second knob chooses one of 10 (!) possible MC cartridge loads: 15, 30, 50, 75, 100, 500, 1k, 10k, 47k ohm, or "OPT," which allows users to use custom load values made via resistor-equipped RCA plug-ins. A high-pass/subsonic filter button sits between a mono button and a knob for dimming the meter display.

The MasterPhono consists of two bolted-together chassis: a front one for the power supply and control functions and a back one for audio amplification and passive RIAA filtering. The separate chassis are joined by wood side pieces and connected electrically via three shielded, wire-carrying conduits. MoFi design engineer Peter Madnick told me by email, "The MasterPhono has the noisy stuff in the front enclosure, analog processes in back.

"In the front is the microcontroller board and the main power supply. In the rear audio circuit enclosure, the discrete JFET amplification and passive RIAA are separately housed within a temperature sensitive, shielded copper enclosure.

"The main power supply board has a tiny AC-to-DC 5V 'keep alive' supply, which runs the microcontroller whenever the rear AC power switch is ON and also powers the latching relays when it is time to switch any of them."

Peter seemed proud of how his "latching relays" operated, so I asked him to explain. "There are two general types of electromagnetic relays. The predominant style is called mono-stable, meaning they have one preferred rest state (call it the OPEN position), and when you apply current to the energizing coil, it fights the latching spring and pulls it closed. In order to remain closed, it must remain powered, consuming current just to continue to overcome the spring that wants to pull it open, and [that is] why they are called nonlatching. On the other hand, the bistable relays I use are comfortable resting in either their OPEN or CLOSED position because they have a kind of mechanical lock (the latch) which holds them in that position. Current is only required to flip it over to the opposite latched

1 See stereophile.com/content/listening-162.

position. No current needs to flow to keep it in one spot or the other."

I told Peter I didn't realize that phono stages need relays or microprocessors, but I was sure they needed a quiet, well-regulated power supply. I encouraged him to talk about that. "The main operating voltages are generated by two 24V AC–DC converters. Their output is prefiltered by a choke and capacitor filter and feeds a pair of 22V preregulators prior to traveling through the chassis-to-chassis shield pipe to the audio boards in the back chassis. Note that all the capacitors are audio-grade, low-ESR types and are heavily bypassed with film caps.

"All told, there are 26 active power supply devices powering the audio stages; we reached the point of diminishing returns. If you can make it any quieter, I don't know how to do it."

Use and setup

In operation, the MasterPhono's knobs and Power button have an unusual, floaty, unmechanical feel. Whenever I changed inputs, cartridge load, or gain, it felt like the knobs were not touching anything. There were no detents or clicking noises to indicate that the next position had been reached. Instead, after a moment, a light lit up over the new selection. Initially, I found this untethered feeling uncomfortable, but after a while I stopped noticing it.

The red-orange meter lights can be extinguished by a quick push of the Meter button or the Light button on the snazzy, sculpted-aluminum remote control, which duplicates the controls on the MasterPhono's front panel.

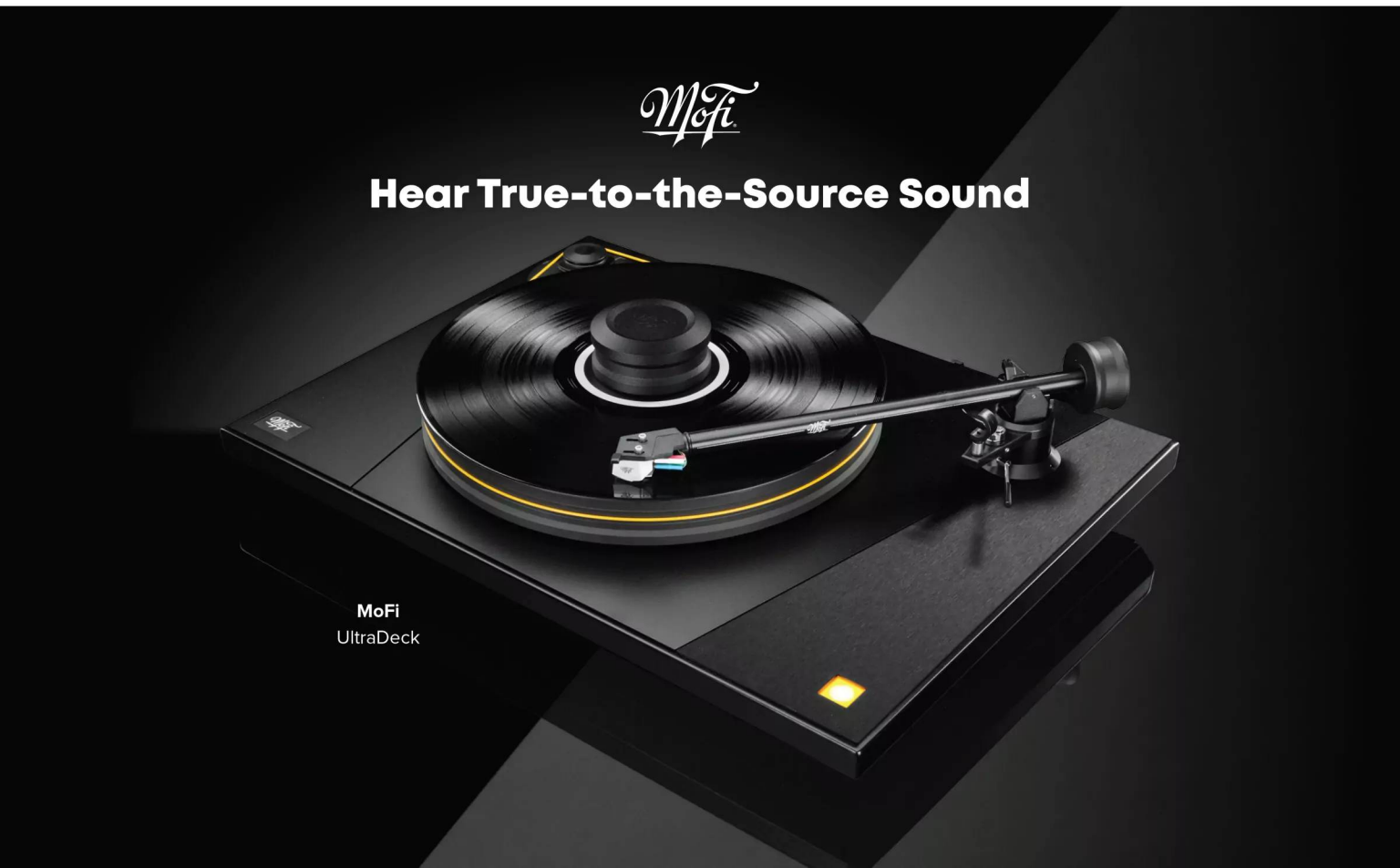
It's not mentioned in the owner's manual, but that Meter button serves other functions not usually found on a phono stage at this price level. Hold the Meter button down for a few seconds, and the INPUT 1 indicator light begins to blink. Now the MasterPhono is in TEST MODE 1, which allows users to calibrate the metering using the 1kHz tone on Side 1, Track 1 from Analogue Productions' *Ultimate Analogue Test LP* (AAPT1). This sets the correct level as "0dB."

Holding the Meter button down again moves the MasterPhono into TEST MODE 2. Here, using the –20dB, 1kHz tone on track #4 of AAPT1, the user can observe what happens when the test electrically subtracts the right channel signal from the left channel signal displaying the difference. Madnick says this is useful for adjusting azimuth. He's correct of course. This is accomplished by finding the cartridge azimuth setting that gives the lowest meter reading.

I tried TEST MODE 2 with every cartridge mentioned in this report, and it works. But a better method (I am told) is to use the left-right 1kHz tones on AP tracks #2 and #3 to measure crosstalk with an oscilloscope, or, like I do, with a Musical Surroundings Fozgometer, which sets azimuth by comparing the output of the unmodulated channel to the output of the modulated channel. The two approaches accomplish the same thing; both approaches helped me feel more confident about azimuth settings. Of the three methods, I prefer the needle-steady repeatability of the Fozgometer V2. Nevertheless, if you've never used a meter to adjust azimuth, the MasterPhono gives you a perfect way to start.

Holding down the Meter button one more time again moves the user into TEST MODE 3. "For now, this mode remains undefined," the online instructions say, "but will eventually be enabled via software update." Holding it down a fourth time puts the MasterPhono back into normal operation.

What I like most about the MasterPhono is its three inputs, selectable from the front panel: a regular single-ended RCA, a balanced XLR, and a transimpedance (current-



drive) input that gives users a choice of either single-ended or balanced connection.

Listening

Don't ask me to explain this. The solid state MasterPhono took three full days to lose all the gray flatness it showed on the first day, just like the tubed PrimaLuna EVO 100 phono stage I reviewed in this space last month. When it finally lit up, its unusually bold dynamic contrasts made Bartók's *Sonata for Two Pianos and Percussion*, with pianists Tristan Fry and James Holland (White label LP, London CS 6583), into a succession of startling moments.

I was playing this exciting-sounding Bartók with EMT's JSD6 moving coil cartridge, loaded at 500 ohms. The tonearm was EMT's new 912, sporting a Cardas Clear Beyond tonearm cable. The sound was cloudless, *big*-sky expansive—unusually spacious for solid state, with at least 20% more depth and height at the back of the soundstage than I get from the all-tube PrimaLuna EVO 100. Bass was thunderous and lightning fast. Bartók's use of big drums, contrasting with little drums, felt perfectly expressed. The close-miked pianos tore through tempos like a storm on the prairie.

With the MasterPhono, this wild, stunning disc made me feel like *I* was the one pounding the piano. Piano sustain and percussive drum sounds were presented solidly, right there in front of me, with the Heretic AD614 speakers. Percussion transients were naturally sharp-sounding and dramatically *impactful*, but never hard, overemphasized, or compressed. This Bartók sonata was not as free-flowing supple or as colorful as it was with the PrimaLuna EVO 100, but it was unquestionably more dynamic and dramatic.

The Bartók sonata came through the MasterPhono with intoxicating levels of power and clarity, but that was nothing compared to the high-energy excitements of René Saorgin playing toccatas by Georg Muffat, from his composition *Apparatus Musico-Organisticus*, on the historic organ at Malaucene in Provence (Harmonia Mundi France HMU 966/967). This disc energized my room at average SPLs of 100dB and much higher (2m, C-weighted), with 112dB peaks that sounded so relaxed that I guessed it was playing at least 10dB lower than that. I checked the SPL with my dB meter because the low organ notes were shaking my easy-to-shake floor, and I wondered how much energy it took to make that happen. Loud organ music can be goosebump-thrilling, but only when it doesn't *feel* loud. With the EMT-MasterPhono combination, it didn't.

It's been a while since I heard anything more mind-grabbing than these four sides of Georg Muffat toccatas.

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After living the previous month with PrimaLuna's 10-tube EVO 100 phono stage, I kept checking in with myself to see if I found the MasterPhono transistor-y—hard, shallow, gray—but it never did. Instead, it walked a narrow line between hard and soft, dry and wet, warm and cool—leaning maybe 10% towards wet and warm on the most atmospheric recordings. It did not attenuate reverberation or diminish atmosphere. I never consciously wished for tube treats I wasn't getting.

With the $1k Lenco

With the plastic Denon DL-103 cartridge, on the aluminum aftermarket headshell, I could probably get $1000 for my low-mileage Lenco L75 turntable. For that reason, I've named it "My $1k Lenco." I continue to marvel at how much solid, Technicolor excitement it pulls from the grooves of black discs. I'm not sure why this machine disarms my critical thinking and keeps my mind glued to the musical program. Through the MasterPhono, the DL-103 seemed to magnify and intensify tempo and key changes—a very engaging effect—while presenting recordings with an almost irrational sense of straightforward rightness.

Playing the same records first on the $8395 Dr. Feickert Blackbird with EMT's 912 arm ($6500 with DIN connection) and $3195 JSD6 cartridge ($18,000 total) and then, only minutes later, on the $1k Lenco is the kind of comparison I enjoy making because it's really not about better or best or which one comes closest to some preconceived ideal. It's about the *feel of the ride*. Imagine getting out of a modern Porsche and slipping into an unrestored Porsche 356.

To start, I loaded the DL-103 at 500 ohms and played one of my most-played albums: ragas by Ali Akbar Khan off the album *Bangla Desh* (LP, Connoisseur Society CS-2042). The sound was so physical and high-energy vibrant that I was forced to ask: In what ways was the Lenco's Ali Akbar Khan inferior to the Feickert's? In what ways did Lenco's steel arm and Denon's plastic-bodied cartridge reveal their lower-caste status compared to the EMT's refined and dynamic 912 arm and JSD6 cartridge, mounted on a modern turntable, the Feickert?

When it finally lit up, its unusually bold dynamic contrasts made Bartók's *Sonata for Two Pianos and Percussion*, with pianists Tristan Fry and James Holland, into a succession of startling moments.

What I noticed most when switching from the high-resolution JSD6 to the less-detailed, less dynamic but earth-grounded DL-103 was that I enjoyed different aspects of the same recording. With the 103, the reverb and harmonics of Akbar Khan's sarod had a denser, more driving foundation. The Lenco-103-MasterPhono combo exposed the rhythmic forces driving "Raga Bhim Palashree," allowing me to trance out easily and float my way into a pulsing, percussion-driven delirium.

I have no idea why, but with PrimaLuna's EVO 100, I preferred the DL-103 with a very heavy, 50 ohm load, but with the MasterPhono, it seemed most natural and unaffected at either 100 or 500 ohms.

With Dynavector's XX2 MKII

When I wrote my first Dr. Feickert Blackbird story, in Gramophone Dreams #25,[2] I did not notice that its back tonearm slot only accommodates 9" arms, that is, arms with a pivot-to-spindle distance between 205mm and 240mm. The 10.5" Schick tonearm, which I was planning on using for this report, has a pivot-to-spindle distance of 270mm, so it wouldn't work. Then I noticed how the Schick's arm collar looked like the arm collar on my Sorane SA-1.2 tonearm, which is in the range for a 9" tonearm. For fun and more learning, I installed the Sorane tonearm, loaded up with the $2150 Dynavector XX2 MKII moving coil cartridge. I chose the Dynavector because I use it a lot, and I knew in advance that it sounds alive and clear with voltage *and* current-drive preamps. The first thing I listen for when installing a moving coil cartridge is dynamic trackability. Treble detail, high-frequency spatiality, and a sense of inherent quiet happens when the stylus stays tight to the groove above 5kHz.

The upper-frequency energy of a full orchestra is harmonically extremely complex and also powerful. This energy can make a normally well-behaved stylus hop and shiver in the groove, which in turn makes the sound grainy and harsh. Loaded at 100 ohms, Dynavector's XX2 sounded smooth, quiet, and steady, as if it were perfectly damped for tracking anything. With the MasterPhono playing Ravel's Concerto in G Major for piano and orchestra from *Les Deux Concertos pour Piano*, with Samson François on piano and André Cluytens directing the Orchestre de la Société des Concerts du Conservatoire (LP, HMV France C 069-10867), my attentions were lashed tight to the timbral accuracy, microdetail, and reverberant air of the top three octaves. With Dynavector's XX2 and MoFi's MasterPhono, the Orchestre de la Société des Concerts du Conservatoire sounded bold, each instrument or group of instruments explicitly described. The midrange had a faint warm glow. Notes from François's piano had attention-grabbing heft and harmonic depth. High frequencies sounded more transparent than they usually do (though with a faint haze), and middle frequencies possessed electrostatic-headphone levels of textural and harmonic nuance. Ravel's Concerto en Sol Majeur came through with all its power and vigor

2 See stereophile.com/content/gramophone-dreams-25-dr-feickert-jelco-koetsu-my-sonic-lab.

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Current drive

Dynavector's overachieving XX2 features a line-contact stylus on a solid boron cantilever with copper coils situated in the field of an Alnico-5 magnet. Coil resistance is specified at 6 ohms, which on paper suggests it should play nicely with transimpedance/current drive headamps. I've used the XX2 extensively with Sutherland Engineering's SUTZ transimpedance headamp. With that preamp, it plays vivid, transparent, and full-tilt boogie momentumwise.

My experience with current-drive moving coil stages began back in 2016 with Dynavector's P75 Mk.3 "Phono Enhancer" current-drive stage, which I used with Dynavector's 20X2 MC.[3] At that time, I did not fully grasp what transimpedance was doing, electrically or sonically. It wasn't until I listened at length to Ron Sutherland's Little Loco transimpedance phono stage that I realized that with certain cartridges, current drive improves tracing of highly modulated grooves, resulting in blacker, quieter, more transparent, more beautiful soundscapes—that, anyway, is my theory, and it seems consistent with what is known about how current-drive phono stages work. Intriguingly, Dynavector's 20X2 and XX2 moving coils loaded by a dead short sound a lot like DS Audio's photo-optical cartridges and Grado's low-output Aeon3 and Epoch3 moving iron cartridges—all of which present recordings as emerging from a spooky-black quietness.

Once again playing Ravel's Concerto en Sol Majeur with Samson François, but this time through the MasterPhono's RCA current-drive input, that faint haze I had noticed in the top octaves in voltage mode had disappeared completely. What was preserved, and perhaps even enhanced, was the XX2's dynamics. Think clear-pond transparency with real jump and *pow!*-factor.

With the MasterPhono's current drive, the XX2 excelled at midrange textures and subtle dynamic shadings, with toe-tapping PRaT and above-average jump factor. But in other areas, it was no match for Ron Sutherland's SUTZ transimpedance headamp.

Sutherland Engineering's $3800 SUTZ transimpedance headamp doesn't do RIAA correction; think of it as a step-up transformer but without the transformer. Using the SUTZ into the MasterPhono's voltage-drive input at 40dB gain and 47k load—using the MasterPhono as a moving magnet phono stage, in other words—I heard a deeper clarity, a more sparkling transparency, backed up by less inhibited, more powerful dynamics plus thunderous bass that shook my easy-to-shake floor.

Ravel's Concerto en Sol Majeur came through with all its power and vigor intact.

It is useful to think of this MoFi–Sutherland comparison this way: In the MasterPhono, current drive is just one feature among several. All those features require power and chassis space and cost money to execute well. Current drive is the Sutherland Engineering's SUTZ sole function, its *raison d'être*. Its transimpedance gain got all the funding, all the power, and 100% of the chassis space.

With MoFi's MasterTracker

Mark me down as a forever fan of moving magnet/moving iron cartridges. I see them as more relaxed, more right brain, more music first than moving coil cartridges, which often get too wowie-zowie hi-fi for my kind of relaxed, dreamy listening. Compared to moving coils, my favorite Grado, AudioTechnica, and Goldring moving magnets present recordings in a quiet, river-flowing manner that more closely resembles magnetic tape.

With that in mind, I decided to end this column by getting fully MoFi-d. I installed MoFi's "smart" cartridge, the $799 MasterTracker moving magnet, which I reviewed in Gramophone Dreams #20.[4] "Smart" is my word, not MoFi's. I call it smart because it is a wisely conceived design that sounds vital and sharply focused. Mainly, though, I call it smart because it comes with the absolute best removable stylus guard in the history of all cartridges.

One of the first discs I played with the MasterTracker was the just-released, remastered, luxuriously repackaged reissue of Pharoah Sanders's classic 1977 album *Pharoah*, originally issued on the India Navigation label but now on Luaka Bop (LP, 6 80899 8008-1-5). This fanboy-collectable box set includes a second disc with two wildly different live versions of Sanders's masterpiece "Harvest Time." These previously unreleased recordings are from Pharoah's summer-of-'77 European tour. They throw an enlightening light on the mind of an artist I always want to know better. These three performances of "Harvest Time" are so different that whatever stays the same must be what Sanders regarded as the structural/conceptual core of this composition. Experienced as a group via this box set, these three versions offer a rare view into the creative thinking of an authentic poet-mystic.

Through the MasterPhono, MoFi's MasterTracker played all three versions in a relaxed, brilliant-but-dark manner that synched well, tone and texture-wise, with Mr. Sanders's mesmeric incantations. Every time I get tired of using moving magnets it's because I'm jonesing for the sparkle, dynamic vigor, and transient intensity that moving coils can provide. The MasterTracker MM feeding the MasterPhono played against type, delivering transient virtuosity with copious portions of sparkle and glow.

Are you ready for business class?

If your turntable cost more than a few thousand dollars and your taste in cartridges is moving further into four figures, MoFi's MasterPhono was created to assist you in your phonophile evolution. For me, a reviewer, it is what I'd been casting about for: alive and vigorous, clear and well-sorted, relaxed and natural, a midpriced, user-friendly phono stage that's easy to recommend and enjoy. ■

3 See stereophile.com/content/gramophone-dreams-10-page-2.
4 See stereophile.com/content/gramophone-dreams-20-lounge-audio-mofi-ultradeck.

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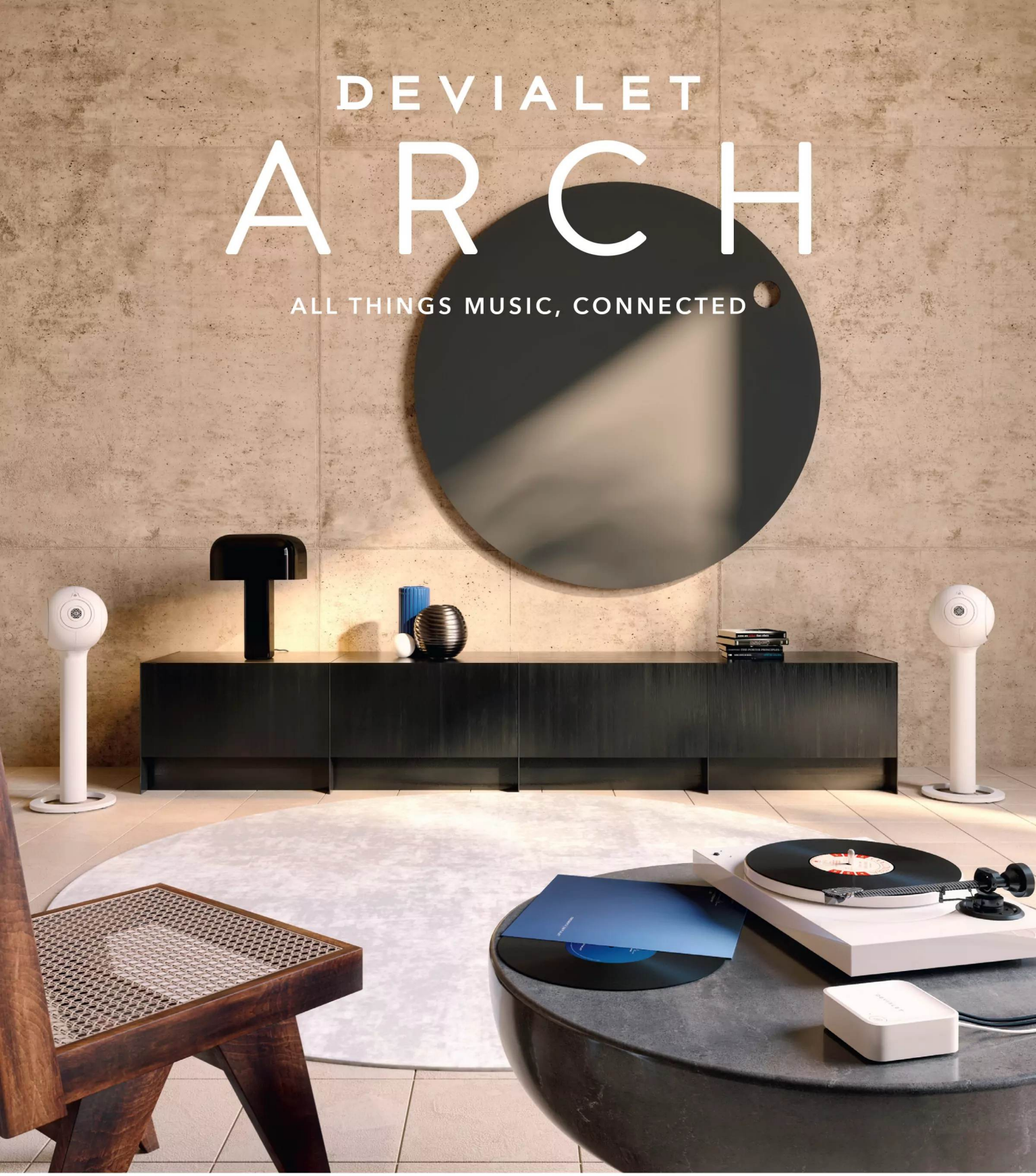

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BRILLIANT CORNERS

BY ALEX HALBERSTADT

THIS ISSUE: Two outstanding tubed phono stages with contrasting personalities.

Realizing the analog you

"The phonograph record is an art form itself," Lester Koenig wrote in March 1959, "and one of its advantages is the performance that exists uniquely of, by and for the record." Remarkably, when Koenig included this pronouncement in his liner notes to *Sonny Rollins and the Contemporary Leaders*, the 12" long-play record had been the dominant carrier of recorded music for less than a decade, and stereo discs had been mass produced for just over a year.

For Koenig, this issue wasn't merely academic. Before making his name as head of Contemporary Records in Los Angeles, he had attended Yale Law School, worked as a screenwriter and producer at Paramount, and gotten blacklisted by the House Committee on Un-American Activities. At Contemporary, he set out to become a leading practitioner of the art of phonography. The label's smart record jackets often used William Claxton's now-classic photographs, Robert Guidi's playful drawings and layouts, and matterful liner notes by Nat Hentoff and Leonard Feather. And in his search for an ideal sound, Koenig procured exotic, state-of-the-recording-art gear—Neumann and EKG condenser mikes and Ampex tape recorders—and in 1956 hired a young engineer named Roy DuNann away from Capitol Records, where he (DuNann) had worked as an assistant to the brilliant John Palladino. (Years later, Koenig brought on another promising young engineer, Bernie Grundman.)

For many listeners, me included, the records Koenig and DuNann made at Contemporary's converted-shipping-room studio on LA's Melrose Place stand as the finest-sounding jazz records ever made. In their clarity, spaciousness, naturalness, and lack of needless effects, they seem almost Japanese. It's possible that DuNann's fame might have eclipsed that of his East Coast colleague, Rudy Van Gelder, if not for the fact that Los Angeles simply couldn't compete with New York as a home for top jazz talent. As terrific as the sides by Contemporary regulars like Shelly Manne, Hampton Hawes, and Art Pepper often were, they lacked the era-defining significance of the records Van Gelder was cutting with Miles Davis, John Coltrane, and Thelonious Monk.

Fundamental to Koenig's insight about the art of record making was the recognition that LPs weren't simulacra of reality but an esthetic world unto themselves that differed from live music in important and delicious ways. Working in a studio allowed engineers and producers to create soundscapes that couldn't exist anywhere else—the hyperreal experience of hearing Nat King Cole singing from several inches away into an RCA 77 ribbon microphone was available only on a hi-fi. The 44-minute span of the LP's two sides allowed for extended suites and thematic explorations. Stereo enabled another set of sonic constructs—chief among them the soundstage and panning. Multitracking added further possibilities. What emerged was a narrative medium that vastly outstripped the creative potential of live performance; it was constructed entirely in the studio and constrained only by the artist's imagination.

Koenig recognized that recording—often conceived of as primarily a technical process—was mostly a matter of sensibility and taste. I think the same applies to the other side of the audio equation: Listening to music at home touches on just as many issues of sensibility. Beyond the simple scale of good, better, and best sound, a hi-fi component is a result of thousands of esthetic decisions reflecting its maker's vision of what the ideal listening experience should be.

Nowhere is this truer than in the neurosis-sowing world of record players and their supporting accoutrements. For the past several months, I've been listening to two phono stages that reveal the contrasting visions of beauty and fidelity of the individuals who conceived them. Spoiler alert: Both devices are pretty great at making music, though in distinctly different ways, both of which I found difficult to describe relying on the conventional glossary of audio writing.

TRON ELECTRIC CONVERGENCE SIGNATURE PHONO STAGE

The Tron Electric Convergence Signature is a rather unassuming object assembled in Uxbridge, a suburb of London, by self-described "master craftsman" Graham

Tricker.[1] Perusing the copy on his company's website confirms that Tricker is not a man broken by a lack of confidence—the words "perfection" and "perfect," referring to his designs, appear with numbing regularity. As my grandmother liked to say, nobody's going to blow your horn unless you blow it first.

The Signature is a souped-up version of the stock Convergence, Tron's entry-level phono stage; Tricker told me its name refers to "converging high performance and realistic pricing." The website further tells us that the Signature, which costs $4000, "has selected components fitted, plus a few other improvements incorporated that Graham found to improve the audio fidelity even further." What these components and improvements are I wasn't able to ascertain.

Glimpsed from the outside, the Tron is a rather plain-looking thing about the size and shape of a small shoebox. There's a power switch on the front and on the back the expected two sets of RCA jacks and a ground lug. On the bottom of the chassis is a switch allowing the ground to be lifted. There are no options for setting loading or anything else. The moving coil version, which I auditioned, has 68dB of gain; versions designed for moving magnet and mono cartridges are available.

Curious about what lay inside this enigmatic box, I unscrewed an army of Torx screws and removed the lid, which revealed a pristinely populated circuit board. On it, two adorable, potted step-up transformers of unspecified origin precede three tubes—a pair of 12AX7s and a 12AU7—sourced from Russia. Nearby is a pair of unidentified and fancy-looking film capacitors and a well-shielded choke. The layout and workmanship are orderly and surgically neat.

I listened to the Tron using three low-output moving coil cartridges—a Dynavector Te Kaitora Rua, a rebuilt Ortofon SPU Classic G, and a Hana Umami Red—and despite the lack of loading options, its personality remained unnervingly constant.

How can I best describe for you the experience of listening to the Tron? Imagine cooking a simple beef chili—ground chuck, beans, tomato sauce, onion, chiles—and then serving it right away. You'd probably have something tasty but a bit unremarkable. But what if you added to it cocoa powder, cloves, cumin, and red wine? Or maybe you went crazy and replaced the chuck with short rib, and then added ground coffee or porcini powder or even a good Thai fish sauce, and then kept it in the fridge for two

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days before serving it? Quite possibly, now you'd have a dish with a memorably deep, caramelized, and lingering flavor. If you replace "flavor" with "tone," you'll begin getting a sense of the Tron's sound.

On the title track from *On the Beach* (Reprise R 2180), the Tron lent Neil Young's sorrowful electric guitar a thick, chocolaty tone; along with his haunted singing, it came through the speakers with spooky, astonishing presence. The Tron also excelled at chunk, deep color, drive, and drama, and conveyed this album's desolate-yet-inspired songwriting with all of its emotional charge intact. If you've read this column before, you must know that this excited and pleased me, playing directly to my preferences or, speaking less charitably, my prejudices.

Fortunately for the Tron, this burnished, rich sound doesn't include bloated bass, slow transients, or the other sonically gooey artifacts associated with some vintage-style tube circuits. This British phono stage sounds clear, fast, and articulate, never losing track of the music's heartbeat. During my time with it, it was admirably quiet and operated with zero disturbances or hiccups.

What I enjoyed even more about the Tron is that it reproduced music with what I can only describe as palpable beauty, lending textures a certain euphony and golden-hour glow. On "I've Told Ev'ry Little Star," an obscure Jerome Kern–Oscar Hammerstein number from a mid-1970s repress of the aforementioned *Sonny Rollins and the Contemporary Leaders* (Contemporary S 7564), Rollins's tenor, played at a sprint, somehow managed to sound both agile and maximally dense. "Wow, it sounds like it's *right there*," said Ken Micallef, who was over for a visit. But Barney Kessel's guitar, panned hard left, may have sounded even more wondrous: it was as colorful as a Matisse canvas and achingly lovely, a testament to Roy DuNann's artistry and craft.

If you enjoy harmonic richness, saturated tone color, and presence as much as I do, you will likely love the Tron. It has a sound I associate with phono stages that first route the signal through a transformer. SUTs tend to offer this type of tonally rich presentation, which sometimes comes at the expense of fine detail, and the Tron is not totally exempt from this tradeoff.

In comparison with the Manley Steelhead RC phono stage I've been using, the Tron produced richer, more colorful images and simply sounded more beautiful. But it omitted some of the ambient information and long decays that the considerably more expensive Manley extracted from my records. After Ken and I listened to the title track from an early stereo pressing of Miles Davis's *Someday My Prince Will Come* (Columbia CS 8456) on the Manley, we switched to the Tron. "The halo around Davis's trumpet is gone," Ken remarked, and sure enough, the distinctive reverberant presence of Columbia's 30th Street studio was no longer as audible. The air around the instruments didn't sound as charged, nor were they as audibly separate. And, compared to the Manley, the Tron's images were not as billowy or large. Do note that these omissions became obvious only during direct comparison.

The Manley Steelhead, which uses a transistor instead of a transformer in its first gain stage, makes for a wonderful reference because of its balanced sound and (at least) excellent performance in every sonic and musical category, as well as its unparalleled flexibility. The Tron Convergence Signature is a more niche product—a glorious-sounding companion to low-output moving coil cartridges for listeners who value tone, presence, and

1 Tron Electric. Web: tron-electric.co.uk. US distributor: High Water Sound/Jeffrey Catalano, 274 Water St., New York, NY 10038. Tel: (212) 608-8841. Email: jeffrey@highwatersound.com. Web: highwatersound.com.

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beauty above all. I could live with it quite happily forever.

PRIMALUNA EVO 100 TUBE PHONOSTAGE

I've never met PrimaLuna's Herman van den Dungen, but he must be as stubborn as a stuck zipper. Just look at the way he spells "phonostage," smushing the two words together. And who else would make a nearly 30lb phono stage with 10 (!) tubes in it?

Despite PrimaLuna's rather humdrum case design, one look at the EVO 100,[2] which costs $3695, reveals that it's a decidedly out-there product. Its chassis resembles that of the superb EVO 400 line stage that sat on the shelf above it[3] but is only half as wide, and it has the same huge (for a phono stage) power transformer. Pop off the bottom cover and you can take in the neat point-to-point construction. The PrimaLuna's side panels contain a switch for power and another for setting capacitance loading. On the front are knobs that allow a user to select from three settings for gain and five for resistive loading (ranging from 50 to 500 ohms), and buttons for muting and for choosing between moving magnet and moving coil modes. Also visible from the front are eight tubes: two 5AR4 rectifiers, two EL34s for power supply filtering, and four 12AX7s under spring-loaded metal shields for RIAA decoding and amplification. And get this—a little metal door held in place by four fasteners on the back of the unit reveals a Faraday cage holding two more tubes: a pair of 6922s that provide additional gain for the moving coil section. The whole thing feels as elaborate and whimsical as a dollhouse.

An *all-tube* phono stage—one without transformers or transistors providing some of the gain—is a decidedly rare animal. According to PrimaLuna importer Kevin Deal, the EVO 100 was a collaboration between van den Dungen and Jan de Groot, with inspiration from ex-Goldmund designer Marcel Croese, the man behind the EVO 400 (which itself uses a whopping eight tubes, including two rectifiers). Deal also told me that one of the main design objectives was lowering noise, which explains the Faraday cage, the tube shields, and the rubber mounts for the tubes. It also explains one of the most unexpected things about this phono stage (or phonostage): it is the quietest one I've heard, ever. With the preamp volume set to listening volume (and I like to listen loud), I put my ear to the 105dB-sensitive Klipsch La Scalas and heard only the faintest rush, like a breeze on a summer night blowing through the almond trees in a distant valley.

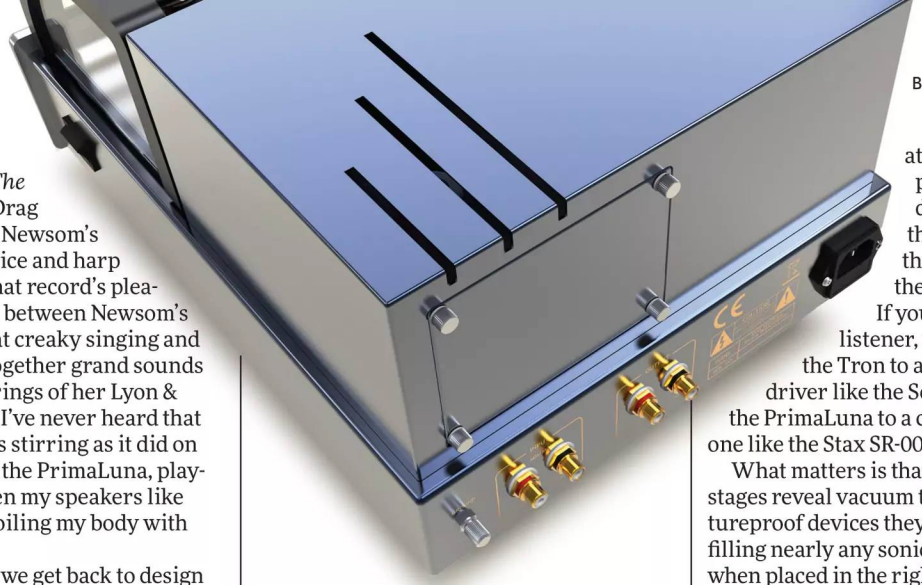
My initial listening impressions of the PrimaLuna were hardly positive. It sounded listless, grayish, and shut down and emphasized groove noise to a perverse degree. Whatever it was supposed to be doing just wasn't happening. I called Deal, who told me that the review unit was fully broken in. But he also told me that it needed to be left on for three days straight to shake whatever malaise or evil eye it might have picked up during shipping—a procedure he recommends with all tubed gear. I've owned tube gear for nearly 30 years and have never heard of such a thing, but Deal has been selling tubes and hi-fi for even longer, so I decided to take a drink from his cup of mystery brew.

To cut to the chase, Deal is on to something. I left the PrimaLuna on for about 100 hours, then sat down to encounter a completely different product. Something inside it had woken up—and I mean all the way up. The music in front of me pulsed and shimmered on a huge soundstage and had a liquid, luminous character I associate with great tube circuits.

The only factor that detracted from my enjoyment of the sound was a slight but persistent glassiness, so I replaced the inner pair of PrimaLuna-branded (presumably Chinese) 12AX7s with early-1960s RCAs, and the stock 6922s with made-in-Holland Amperex Bugle Boys. While this substitution made the EVO 100 slightly noisier—clearly the stock tubes had been carefully selected—it also got rid of the glassiness and, tonally speaking, thickened the sauce. If you're bridling at using holier-than-thou vintage tubes in this product, I submit that spending $300 to $600 with a reputable tube dealer to improve the sound of a $3700 phono stage is not an utterly insane use of your hard-earned money.

The broken-in, warmed-up, pimped-out EVO 100 proved to be a delight. It paid particular dividends with acoustic instruments and reverberant spaces, so I listened to more Ravi Shankar than might be advisable, reveling in the textures of his sitar and the meditative drone of the tanpura. On Raga Hameer from *Ragas Hameer & Gara* (Deutsche Grammophon 2531 216), Shankar's sitar resounded seemingly forever, especially in the slower early section, showing off the instrument's plaintive, complex harmonics with particularly keen insight.

The EVO 100's quicksil-



ver character also made me reach for *The Milk-Eyed Mender* (Drag City DC263), Joanna Newsom's suite of songs for voice and harp from 2004. One of that record's pleasures is the contrast between Newsom's adenoidal, somewhat creaky singing and the pellucid and altogether grand sounds created by the 46 strings of her Lyon & Healy Style 15 harp. I've never heard that instrument sound as stirring as it did on that record through the PrimaLuna, playing in the air between my speakers like an apparition and roiling my body with goosebumps.

And here's where we get back to design esthetics: No component can be superb at everything, which is why designers have to make choices. In the case of the PrimaLuna, van den Dungen and de Groot worked hard to achieve the ethereal, lit-from-within quality that can only come from an all-tube circuit, and one of the areas that received less of their attention is drive. On the hot slab of classic reggae that is "Confirm Reservation," from Gregory Isaacs's *More Gregory* (Charisma 6203 103), the PrimaLuna excelled at splaying the vocal against the rear wall of my loft and capturing every last iota of ambient information, but the bass, drums, and rhythm guitar of the Roots Radics sounded tuneful rather than commanding. If your musical predilections run toward mostly rock, reggae, hip hop, or—God love you—EDM, then the EVO 100 may not scratch your deepest musical itch. On the other hand, fans of classical, folk, jazz, and other mostly acoustic music will likely rejoice at everything it does so beguilingly well.

In a way, the PrimaLuna turned out to be the inverse of the Tron: instead of highlighting the physicality and tonal richness of voices and instruments, it drew my attention to the speed, pitch, and realistic decay of notes and their interaction with the spaces in which they were recorded. If you're a headphone listener, you might compare the Tron to a great dynamic-driver like the Sony MDR-R10, and the PrimaLuna to a classic electrostatic one like the Stax SR-007.

What matters is that both of these phono stages reveal vacuum tubes to be the futureproof devices they are, capable of fulfilling nearly any sonic and musical brief when placed in the right hands. Both will show you exotic levels of performance—as long as your musical priorities are in line with theirs—and offer high value for your outlay. And both encourage you to understand and more fully inhabit your sensibility. The music and the gear you choose offer clues about the person you're becoming—who do you want to be? ■

2 PrimaLuna USA/Upscale Distribution, 1712 Corrigan Ct., La Verne, CA 91750. Tel: (909) 310-8540. Email: info@upscaleaudio.com. Web: upscaledistribution.com. See Herb Reichert's take on the EVO 100 in his Gramophone Dreams column in the December 2023 issue of *Stereophile*, p.23.

3 See Herb's review of the line stage at stereophile.com/content/primaluna-evo-400-preamplifier.

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SPIN DOCTOR

BY MICHAEL TREI

THIS ISSUE: A turntable by the designer of the Wand tonearm, plus a factory visit.

The Wand 14-4 turntable, and a visit to SME

In prior screeds, I have discussed the category of turntable designers I like to call deep thinkers, who twist their brains to come up with fresh thinking about how to approach the task of playing a vinyl record. If there is a poster boy for deep thinkers, it's got to be Simon Brown.

Brown is based on the South Island of New Zealand. I'm thinking that being in such a far-flung part of the world must have given his head plenty of space to get creative. First, in 2011 he created The Wand tonearm, a striking unipivot design that features a fat carbon-fiber armtube nearly 1" in diameter. Art Dudley wrote about The Wand in 2019,[1] and I highly recommend that you read his thoughts, especially about his struggles to set up The Wand. Over the years, I have worked on a few Wands out in the field, so I'm pretty well acquainted with their fiddliness. If you're the type of person who gets sweaty palms at the thought of installing and aligning an expensive and fragile cartridge on your turntable, I recommend you seek experienced assistance.

While the Wand arm has been around for quite a while, The Wand 14-4 turntable is more recent.[2] The name comes from the turntable's platter: The larger size (14") increases rotational inertia without adding significant mass; the platter has four layers including an aluminum/acrylic/aluminum sandwich (for damping) plus an acrylic mat to interface with the record.

Despite the unusual platter, the most visually striking feature of the 14-4 is the plinth, made from a 1 3/8"-thick slab of German plywood cut into what at first appears to be a quarter section of a large circle. Closer inspection reveals that it has a slightly squashed radius on the curved face, which extends from the front left corner to the right rear, and that the straight sides are unequal in length. Several holes of varying size are punched through the plinth underneath the platter, positioned to break up panel resonances and block vibrations from reaching the arm mount. The structure is supported on three adjustable feet with built-in elastic suspension bands, providing isolation and allowing leveling.

A DC motor is mounted in the front left corner, capped with a large, flat knob that visually matches the power and speed control knob in the front right corner. A thick, flat, Swiss-made belt goes around the platter's perimeter, then under the wide, knoblike part of the motor pulley. Don't do like I did and try to get the belt to ride on the pulley's thick knob; it's wrong and will just fall off. Normally, I would say it's time to "read the freakin' manual, Michael," but the manual is sketchy at best, glossing over a lot of fiddly details. The website isn't much help, either, with various PDFs, videos hosted under different user names and platforms, and information scattered around the site and hard to locate. Brown says this is all being addressed.

An inline switching power supply connects to a recessed socket near the motor; a battery supply is available as an option. Once you have it up and running, a speed sensor under the platter automatically adjusts the speed; I found the speed was spot on at both 33 1/3 and 45. Finally, while my review sample came without it, a new 14-4 will come with a lift-off dustcover that sits on the platter and has a flap that extends over the tonearm.

As easy as the turntable is to set up, the tonearm is a heart-pumping challenge. Art outlined some of the difficulties in his piece, but he didn't mention how the multipurpose alignment tool, with its built-in sharp-edged metal-arc protractor, threatens to slice off your cantilever and stylus if you jiggle it the wrong way. I'm normally as comfortable as anyone handling big-dollar cartridges, but trying to use this tool was giving me hives, so I gave up and used my Feickert protractor.

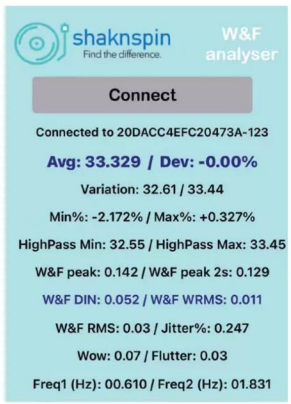
I have found that, with unipivots like this one and VPI's, you can position the protractor by removing the arm wand, then lining up the protractor's pointer with the unipivot cup. Tape down the platter and protractor so that they remain in position and remove the protractor's beam and pointer so that it's out of the way. Doing it this way felt way safer, less of a risk to my Lyra Delos cartridge.

A long slot is provided for mounting the arm, allowing use of three of the four available Wand lengths—9.5", 10.3", or 12"—without modification. The arms also come in three performance levels, Plus, Master Lite, and Master; only the Master is avail-

1 See stereophile.com/content/listening-197-simon-brown-wand-tonearm.

2 The Wand 14-4 turntable costs $5000, the Wand Master Lite 12" tonearm: $3750. 10% discount when purchased together: $7875.

PHOTO BY HIMANSHU RATNAKAR.



able in the 14" length. The two upper levels have addition damping in the armtube and improved wiring; the Master arm adds a vernier-scale VTA adjustment. I received the 12" Master Lite arm, also called the Wand S some places on the website.

A potential concern when using the 12" arm on the 14-4 turntable is that the arm's length means that the cartridge ends up hovering precariously close to the power and speed selector knob. I'm sure you would get used to it, but it's easy to imagine bumping into the stylus when reaching for the knob, especially after imbibing a bit too much. Another lurking danger is the oversized platter: If you miss the mark while lowering the stylus onto the lead-in to the record, you could land the stylus on the outer lip of the platter, where there are several screws holding the platter's layers together.

They say that with great sacrifice comes great reward. The Wand turntable and tonearm is a perfect example of that. I have more experience than most with difficult-to-wrangle turntables and tonearms, but this one nearly had me crying for my mama. When it was done, all the pain and struggle was forgotten as I fell into the music.

Performance

First up, I played "Vignette," from jazz bassist Gary Peacock's 1977 album *Tales of Another* (ECM 1-1101). Featuring pianist Keith Jarrett and drummer Jack DeJohnette, this trio reconnected a few years later to become Jarrett's jazz-standards trio, with the pianist taking over as leader. Even at this earlier date, it's pretty clear that Jarrett was already in the driver's seat. This is a fairly dry-sounding record, but that only helped to make even clearer the Wand's extraordinary ability to present vivid shades of a rich tonal palette, each instrument sounding remarkably realistic and true. I have never before heard Gary Peacock's recorded sound presented with such clarity and vividness. With DeJohnette's snare, you could clearly hear the internal acoustic of the drum as he tapped lightly on the tightly tuned top head, each buzz from the snares sounding focused and resolved.

Switching gears, I put on *Let It Be* by Slovenian industrial band Laibach (Mute STUMM 58). This 1988 record is an almost unrecognizable cover of The Beatles album of the same name, although it omits the title track. Most of the songs have a symphonic-industrial sound with marching beats, grunted vocals, and choirs, but their version of "Across the Universe" with guest vocalist Anja Rupel is beautiful. This song, though, can be challenging to make sound good. With the wrong gear or setup, Anja's multitracked vocals can sound a bit thick and congested. The Wand managed to unravel this thicket of sound, clarifying and opening things up.

The Wand turntable and tonearm are clearly the creation of a single person, Simon Brown. There are no compromises here, and few concessions to ease of setup and use. But if you're willing to put in the work and deal with the setup anxiety, your patience will be rewarded with extraordinary performance. The Wand excels in areas I consider fundamental to musical enjoyment, such as tonal color and timing. The Wand will extract the most from your cartridge. There's nothing warm or sluggish sounding about The Wand, but because it's able to resolve detail so well, it never sounds thin or anemic. "Vivid" and "focused" are the words that keep popping into my head. Definitely recommended—as long as you understand what you're getting into.

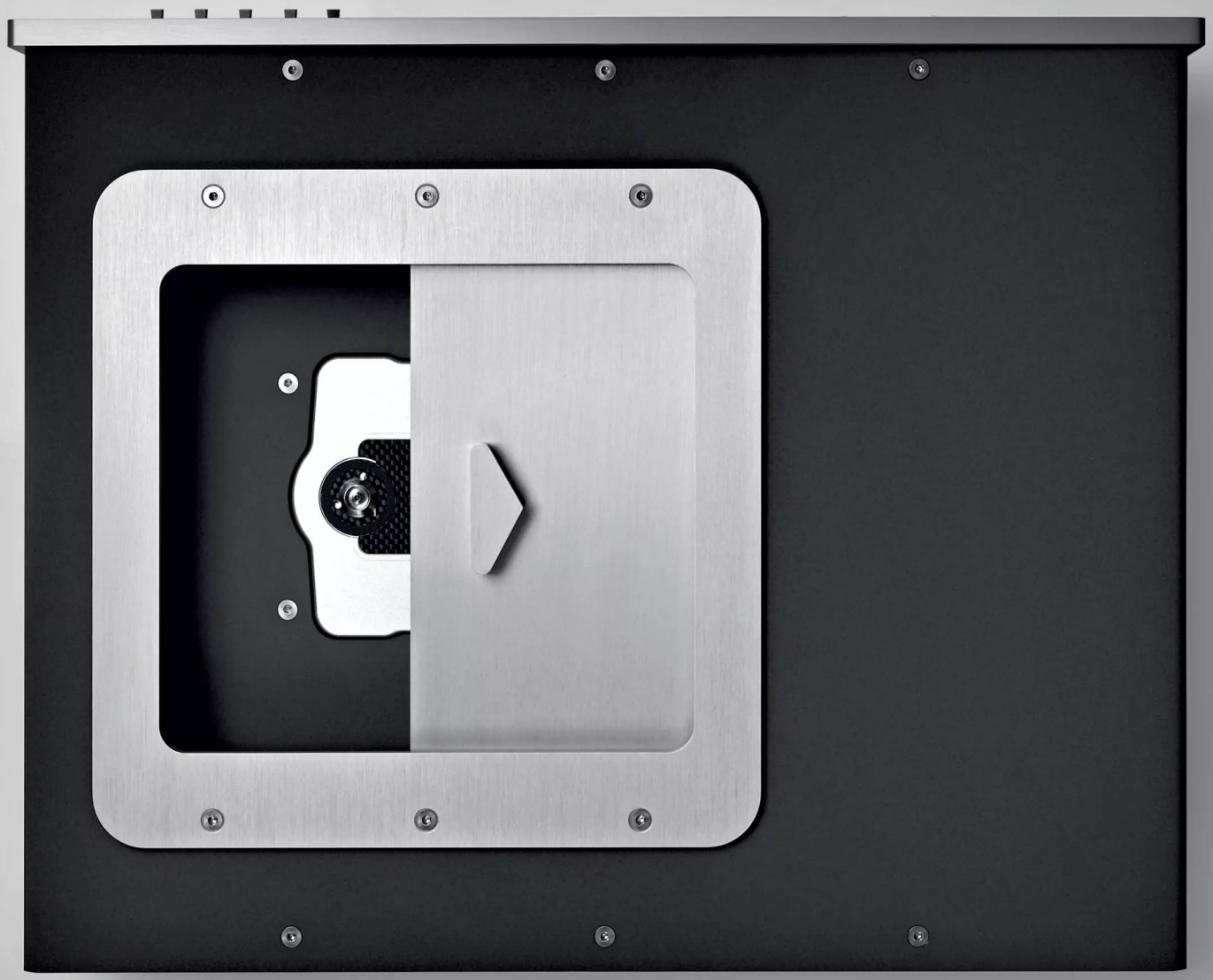
A VISIT TO SME

It's no secret that I have long been a fan of SME turntables and tonearms. But despite having worked on, set up, or owned hundreds of their products over the last 40 years, I have never had an opportunity to visit the place where they are made. Until now.

Nestled in a sleepy village called Steyning in the south of England, SME still operates from the purpose-built factory they moved into more than 60 years ago, although it has been expanded several times.

What struck me first, as I approached the facility, is how the factory is wedged into a tightly packed residential neighborhood, surrounded by small row houses, with kids playing on the tennis courts across the road. SME isn't a loud or polluting business; they live harmoniously with their neighbors.

The main impression I got from my visit is that SME is working hard to find the right balance between their staunchly traditional English roots and modernizing the company to increase efficiency. Founder Alastair Robertson-Aikman (AR-A) died in 2006, but his office has been



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Above, L–R: SME CEO Stuart McNeilis cleans a record with a Loricraft; Kat Ourlian deejays an SME 'table shootout at St Mary's of Bramber.

maintained exactly as he left it, a bit like a shrine, complete with the original mid-century furnishings and wall treatments installed when the factory was expanded in the 1970s, adding a second floor. Those were heady times for SME, when they were making 500 to 600 tonearms a week. The 1983 introduction of the compact disc put the future of high-quality vinyl playback gear into doubt, but SME didn't lose faith. One response was to launch their first turntable, the Model 30, in 1991. Under AR-A's guiding hand, the company survived the 1990s. After his passing, in 2006, his son Cameron took the helm. Under new leadership, SME shifted focus to the other side of their business: high-precision contract work for aerospace and medical companies. Before long, that work accounted for 70% of SME's turnover. On the audio side, to some audio enthusiasts, they appeared to be losing their edge.

Fast-forward to 2016. SME was sold to Cadence Audio, led by Indian businessman and lifelong audiophile Ajay Shirke. Cadence's portfolio includes three other iconic English brands—Spendor, Garrard, and Loricraft—and two connected Dutch manufacturers, Siltech and Crystal Cable. Most of these names will be familiar to audiophiles, Loricraft perhaps less so than the others; Loricraft is best known today for its record-cleaning machines, though it has had a long association with classic Garrard idler-drive turntables and was included as a part of the deal to acquire the Garrard brand.

Shirke immediately realized that reviving SME's audio business would be a delicate balancing act. There was a desperate need to increase efficiency, but it was important not to lose the brand's reputation for intense attention to fine detail and in-house production of almost all mechanical parts. During my visit, I heard several stories about how slow and inefficient things could be under AR-A's intense control, such as the time he asked an engineer to create a prototype for a small assembly, then refused to look at it when the engineer placed it on his desk a day later, saying it couldn't possibly be any good because it was fabricated far too quickly. Another story tells how hours were spent polishing tonearm parts to a flawless mirror finish even though they would end up covered by satin paint.

To implement his plan to revitalize SME, Shirke brought in aerospace-industry veteran Stuart McNeilis as CEO. In the seven years since McNeilis took the helm, SME has been on a rapid path to upgrade and modernize its manufacturing capabilities.

Today the production floor is jammed with new, state-of-the-art machinery jostling for space with legacy equipment that still does the job it was built for. Touring the factory, you really feel they've been here doing this for a very long time. I could practically smell the oil and grease embedded in the building over decades.

This visit was organized for a couple dozen representatives from SME's global distribution network with me tagging along as the only reviewer. After a short introductory talk, we took a step-by-step tour of the factory, with SME's service manager Brian Laker and other members of SME's friendly crew serving as guides. Everyone was there to experience the factory, but the rest of the group also received additional setup training on the lineup of SME products. Because I already have plenty of field experience, working with just about every SME turntable and arm, I used some of this training time to learn a little more about one of Cadence's other brands, Garrard.

This involved a road trip to Ajay Shirke's home, about midway between London and Steyning, which is down near the South Coast. There, I had the opportunity to audition the 301 through Shirke's finely tuned system, using the massive Siltech Symphony loudspeakers and Siltech SAGA electronics. The Garrard 301 was fitted with an SME M2-12R tonearm and an Ortofon Verismo cartridge. Shirke

PHOTOS BY MICHAEL TREI.

treated me to some very special recordings, including a lacquer recording he had commissioned of a sort of mashup between Indian and Western music. It reminded me of Kavi Alexander's superb recording *A Meeting by the River*, with Ry Cooder and Vishwa Mohan Bhatt, only instead of the *Mohan veena* heard on Kavi's recording, this record used a harmonium. The recording Shirke played, which was engineered by the legendary Tony Faulkner, expanded the recording space into the listening room with astonishing focus and clarity.

Most important was how quiet it sounded. Idler drives like the 301 have a reputation for having tons of boogie and drive, but they can sound a bit noisy and in your face. Not so the SME-rebuilt 301; it was spookily quiet and transparent. The current plan for Garrard—a logical next step beyond the Garrard restoration reviewed by Art Dudley in 2019[3]—is to create fastidious, nuts-and-bolts restorations of classic vintage 301 models, sold in new plinths with SME tonearms. But Shirke also revealed that there are longer term plans to make idler-drive Garrards using all-new designs.

This is starting to sound a bit like a review of Shirke's system, so before I get carried away, it's time to return to Steyning for another demonstration. This time it was Cadence's latest employee, Kat Ourlian, who was running the show, with a direct comparison between three SME turntable models. Some readers may know Kat from her years working as the analog manager for Upscale Audio. Cadence has enticed Kat to pull up roots and move to London, where she will be working as Cadence's global marketing director, based out of their new central-London showroom, the Audio Lounge. I got a chance to visit the Audio Lounge on my way back through London. It's definitely worth a visit.

Back to the demo in Steyning. The venue: the music room of a very old house called St Mary's of Bramber. We Americans tend to have a pretty limited perspective of what "old" means and will ooh and aah at any structure built before the 20th century. St Mary's was built in 1477. That's old, although to be fair, The Music Room is a later addition. In this gorgeous space, Kat and my friend Chad Stelly had set up an extraordinarily revealing system using Rockport Orion speakers driven by Nagra electronics with SME Model 6, Model 12, and Model 60 turntables ready to go.

First up was SME's most affordable turntable, the Model 6, followed by a midpoint, the Model 12, and finally the flagship Model 60, which I reviewed in the August 2023 issue. With each step, you could hear the expected improvements: improved dynamics, transparency, and scale. Normally, I would expect a system this revealing to expose the weaknesses of a turntable like the Model 6, but it held its ground well.

After two days immersed in the SME experience in Steyning, I was left with a strong impression that SME is building toward a strong future. I look forward to seeing and hearing what comes next. ■

3 See stereophile.com/content/listening-204-new-garrard-301.

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WORKING THE ROOM

WHAT GOES INTO BUILDING AND OUTFITTING A LISTENING ROOM? ONE OF *STEREOPHILE*'S REVIEWERS FOUND OUT FIRST-HAND—AND ALMOST BIT OFF MORE THAN HE COULD CHEW. A TALE OF WHITE POWDER, A MUMMIFIED DOG, AND VARIOUS DEALS WITH THE DEVIL. TEXT AND PHOTOS BY **ROGIER VAN BAKEL**

AS HAPPY MOMENTS IN ONE'S LIFE GO, this one was supposed to be up there: the time I first heard my stereo rig in the new, custom-built listening room in the back of my home. It had taken eight months to get to this point, starting with gutting the garage and rebuilding the floor and walls. (We kept the roof.) By the end, all-new doors and windows had been hung and treated with acoustical sealant. Extra-thick drywall and mass-loaded vinyl were installed for better sound insulation. A dedicated power line was brought in.

Credit where due: The new room was my wife's win-win suggestion. For a few years, I'd performed my reviewing duties in our living room, a good-sounding space that nonetheless had three problems. A variety of stereo gear had begun to occupy practically a third of the floor, making our digs less suitable for family use and entertaining. When my wife and kids went to bed, I couldn't really crank the volume anymore—and I love listening at night, at (I confess) elevated volumes. Lastly, the living room sits on top of a basement, suspended over joists. I had to be careful with the placement of speakers to keep the floor from acting as a tympanic resonator.

The new room avoided all that. Though it's attached to the house, it was built with enough insulation that I can play music to ear-splitting levels at all hours. And as I type this, under my feet is a seven-layer, open-faced sandwich of gravel, a 10"-thick concrete slab, plywood subflooring, rubber sheeting, oak planks, a thick pad made of felt, and a wool rug that covers about 80% of the floor. No resonator effect.

Changing his tune: Rogier van Bakel's listening room shortly after demolition began. The space had been an old two-car garage.

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During construction, there'd been surprises—some costly, others just a brief pain in the neck. Dolefully eyeing our dwindling funds, I learned that drywallers and electricians easily outearn journalists. Also that despite vertical tarps and scrupulously closed doors, construction dust is the most penetrative thing known to man, except maybe 1980s Radio Shack tweeters. The white, powdery substance somehow wafted into bedrooms up to 70' from where the rebuild was taking place, giving our interior the appearance of a coke lab.

Then there was the glum discovery of—I kid you not—a dead dog, whose half-petrified corpse lay a foot or so under the crumbling, century-old concrete floor. The contractor surmised that the poor thing was a wounded stray that had worked its way into the garage's shoddy foundation, perhaps needing a quiet place to die. I thought of Stephen King (who lives only an hour away), and how in Kingworld, the unearthing of the mutt would have set off a series of terrible events, *Pet Sematary*–style[1].

Luckily, we made it to early 2023 without gory calamities. January 27 was inauguration day. After we assembled the midcentury equipment console and chair, my teenage daughters and I maneuvered my Focal Utopia Scala Evo reference speakers onto the rug. I connected the Scalas to a HiFi Rose RS520, queued up some favorite tracks on Qobuz, and sat down in excited anticipation. This was gonna be great!

Read this out loud in your best Ron Howard voice: *It wasn't*. The music sounded not just subpar—it sounded horrendous. Slap and flutter echoes skittered like high-velocity marbles exploding off the walls. Every song I played was smeared, muddy, incoherent. I had to wonder: The home theater expert who'd informed me that drywall is a pretty good absorptive material[2] ... had he been pulling my leg? I felt the way Charlie Brown might after Lucy snatched his football away.

A panel discussion

To be honest, the disappointment wasn't completely unexpected. In the fall of 2022, I'd absorbed much of the sixth edition of F. Alton Everest and Ken C. Pohlmann's *Master Handbook of Acoustics* and all of Jim Smith's *Get Better Sound*. It seemed inevitable that my medium-sized room (15' × 21', with a 16' gabled ceiling) would need a good number of acoustical panels. My friend Aaron, a math-minded audiophile with a solid knowledge of acoustics, agreed to help. We settled on more than 20 panels of various sizes, most 4" thick, including bass traps for the corners and a quartet of 2' × 4' clouds—overhead absorbers that tame reflections from the ceiling. We also ordered two skyline diffusers for the wall behind my listening chair.

Despite our commitment to good acoustics, compromises were necessary. The goal was always to create a listening room that, big speakers notwithstanding, could just about pass for "regular" living quarters, preferably a combination of modern and rustic. So we had to find solutions that wouldn't make the space look like a control room. The skyline diffusers can pass for works of art (and most non-audiophile visitors assume that they are). The Dorothea

1 For a Google-supplied Easter egg, search for "Pet Sematary" and watch the top of your browser window.

2 See www.gedlee.com/downloads/HT/Home_theater.pdf, page 96.

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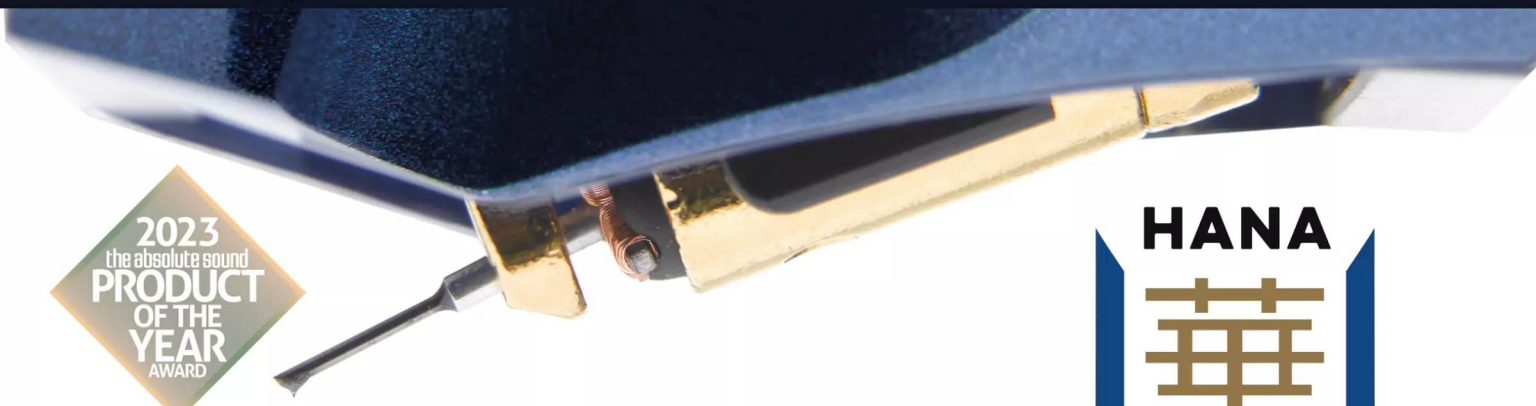

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Lange black-and-white canvas over the electric fireplace—her gorgeous 1939 photo of a Southern country store with Black men sitting on the porch—is an absorption panel at the same time. (It was custom printed to my size specifications by ATS Acoustics, with a file downloaded gratis from the Library of Congress.[3])

About that fireplace: I chose it for heat and atmosphere, even though the 3' × 2' glass front is highly reflective. For critical listening, I often end up covering the pane with a 4"-thick panel—after turning off the heater element, mind you! When it's chilly out, a heat pump installed over the 18' × 4.5' gear closet to my right helps keep the place comfortable. (Hot tip: Running a couple of class-A amps can help, too.)

In trying for a balance between pleasant living space and audiophile lair, I made a few other deals with the devil. For instance, there are no audiophile-approved audio racks in my room. I'd have needed nine or 10 shelves—two racks, give or take. Aside from the expense, high-end racks would've given less of a "livable" vibe to the room, so I'm happy I found the equipment console I mentioned. For the best sound, it should probably be closer to me, along one of the two long sides of the room, but for various reasons, this proved impractical. I ultimately put the console about 2' from the front wall so that I can get behind it when swapping out equipment and cables. The Focal Scala speakers are positioned far enough into the room—their baffles are 7' 6" from the front wall—that the sonic effect of the console behind and between them is small.

Originally, the console wasn't really suited for the heavy amplifiers I intended to place on it. A local carpenter fitted it with vibration-resistant Sorbothane strips, then reinforced the structure with a thick, black valance (spanning the 6' width of the cabinet) that supports the bottom shelf. This had the added advantage that, from my listening chair, I no longer had the distraction of seeing cables on the floor behind the equipment.

Few visitors suspect that the big work of art on the front wall is a TV screen[4]. With its power cable hidden in the wall, its matte finish, and with brightness auto-dimmed to low, it does a surprisingly credible job of disguising itself as a framed photo or painting. (I have always disliked how a large TV looks like a black hole when it's not on.) For months, I'd looked at 4K short-throw

3 See loc.gov/item/2017772305.

4 See samsung.com/us/tvs/the-frame/highlights.

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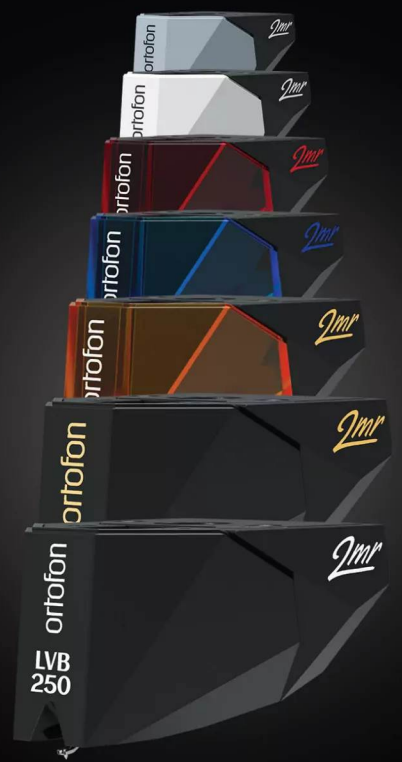

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projectors as an alternative because—well, wouldn't I get audible sound reflections bouncing off a glass TV screen? I needn't have worried. Modern hi-def TVs have much softer screens—try it: Poke one and it gives. All the same, I bought a third-party external wooden frame, in part so that its sculpted, protruding edges would create a little extra diffusion.

Crucially, there's a second reason why there's a screen in the room. Audiophiles with dedicated listening spaces can get isolated from their housemates. I've always enjoyed the domesticity of family life—the patter of kids and dogs, the teasing and joking, the noises of a house alive with activity. It's no small thing to essentially remove yourself from that. Because my wife and children aren't especially into high-end stereo gear or long listening sessions, the TV in the new room is there in part so they can drift in to watch shows and movies together, as a family.

Smaller, cheaper tweaks

Things were rapidly improving sound-wise. Still, a few more room-response issues had to be addressed. On my left side, where there's a bank of five windows, I obviously couldn't mount an absorption panel at the first reflection point. I placed a large, soft-leather couch there instead. The window coverings, too, were chosen for sound-taming effect: They're accordion-shaped, cloth cellular blinds that have minor absorptive and reflective properties.

The panels, from GIK, ATS Acoustics, and others, ended up costing about five grand total, and I consider that something of a bargain considering the enormous difference they would soon make. But I also got good results with smaller, cheaper tweaks. In fact, various improvements to a room's sound are free or can be folded into a normal home-decorating budget. One obvious example: A rug isn't just pleasant for your bare feet; it's a joy to the ears if your room is reflective (too live). When I needed storage containers, a friend suggested a couple of padded, lidded ottomans. Excellent choice. They do double duty as absorbers, and they work a treat.

One evening, I mounted a 4'-long bookshelf on the wall behind the listening position, above the diffuser panels, and was chuffed to discover that I could subtly improve the sound by varying the depth of the books—deliberately pushing some spines farther onto the shelf and letting others jut out a little.

With each modification and addition, things got better. Aaron wisely cautioned me not to overdo it. Neither of us are fans of overdamped rooms, where a *lack* of reflections makes music sound anemic, robbed of energy and sparkle.

All's well that ends well?

The second serious listen came at the end of February. There was still a room mode around 35Hz, but the ARC Genesis room correction software made quick work of it, and we reveled in the excellent sonics. The hassle and just-over-six-figure cost had been well worth it.

Here's the main thing: A dedicated high-end space allows your music's full dynamics to blossom (and not just decibels, though that's a big part of it). It's next to useless to play Led Zeppelin's "When the Levee Breaks," Control Machete's "Si Señor," or the Minnesota Orchestra's version of Rimsky-Korsakov's "The Snow Maiden" at low levels. I'm not embarrassed to say that for me, the power of such recordings isn't unleashed until the SPLs begin to border on unreasonable.

Most audiophiles have spent a small (or large) fortune on speakers and electronics, and another bundle on cables, antivibration solutions, power conditioners, and so on. The vital component most often overlooked is the room. I'm very fortunate that I was able to build mine almost from scratch. The expense seemed excessively self-indulgent until I realized that, unlike equipment, an extra room should more than pay for itself when the time comes to sell the house.

Even if a custom room is not in the cards, more audiophiles ought to consider acoustical treatments. Your mileage may vary, but to me, nine out of 10 times, putting a high-end stereo rig in an untreated listening room seems a bit like playing a Stradivarius with a $5 bow. ■

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JIM AUSTIN

Burmester 216

POWER AMPLIFIER

When I was offered the opportunity to review a Burmester product—the 216 stereo power amplifier—I accepted immediately, mainly out of curiosity. Berlin-based Burmester is an important hi-fi brand, but I knew very little about the company and their products. What better way to learn more than to review one of their products?

Burmester's creation story

When you're building a hi-fi system, there's something *right* about starting with the preamp. It just makes sense. It's what Dieter Burmester did in building a hi-fi *company*.

The preamplifier is the operational hub of any hi-fi system (not counting systems that don't have a preamplifier), but that doesn't fully capture the preamp's import. The preamp is the brain but also the brainstem, the spinal cord, possibly the heart. Its impact on a system's sound may be less obvious than that of the loudspeakers, but that impact is nonetheless *fundamental*, with emphasis on the root word, "fundament": ground, foundation. ("Fundament," I've just learned from an online dictionary, can also mean a person's buttocks. Please try to forget that.)

Burmester started up in 1977 with the 777 preamplifier, which, as you can tell once you know Burmester's nomenclature, came into existence during July (the seventh month) of that year. Dieter Burmester, an engineer and the company's founder, was working in the medical equipment field as a consulting engineer. Dieter was also an audiophile. He was impressed with the performance of certain op-amps used in his test instruments. He assembled the 777 out of medical-equipment parts.

That's a piece of the Burmester origin story: The preamp came first, was fundamental. But every interesting story can be looked at from different points of view. Looking at it from another point of view, the history of Burmester goes back to an earlier point in Dieter Burmester's history. Dieter Burmester was a guitarist. His first instrument was electric bass. His tubed bass amplifier failed frequently. He studied electronics to figure out how to fix it. In time, he qualified as a radio and TV repair technician. Then he built his own, more reliable bass amplifier to take to gigs—and that was the start of his career in sound and electronics. If my math is right, this would have been around 1962, when he was 16 years old. You could trace the company's history back to that. *Bass*, then, is fundamental: the second fundament.

Returning to that preamp: Dieter was happy with the 777. He decided to set up a company. But the bank he approached for financing was skeptical. It doubted a lone engineer with little business experience could compete in a space dominated by big corporations. They chose not to give him his loan. So Dieter went ahead and built some preamps—20 777s—with his own hands and soldering iron. He sold them to friends at what was, for the time, a high price; online sources say the 777 cost as much as a car. Appar-

SPECIFICATIONS

Description Bridgeable, dual-channel power amplifier. Power output (stereo, IEC 62368-1): 100Wpc into 8 ohms (20dBW), 165Wpc into 4 ohms (19.2dBW), 245Wpc into 2 ohms (17.9dBW). Power outputs double when bridged for mono; maximum power output as a monoblock, 490W continuous. Power consumption in standby: 0.46W.
Dimensions 19.5" (496mm) W × 7.5" (191mm) H × 18.8" (479mm) D. Weight: 77.2lb (35kg).
Finish Brushed aluminum and mirrored glass.
Serial numbers of units reviewed 9216060, 9216061.
Price $35,000 (each unit). Approximate number of US dealers: 15. Warranty: 2 years.
Manufacturer
Burmester Audiosysteme GmbH,
Wilhelm-Kabus-Straße 47,
10829 Berlin
Germany
Tel: +49 307879 68 0
Email: mail.burmester.de.
Web: burmester.de.

ently, Dieter had wealthy friends, quite a few of them. The friends who bought the 777 were happy. That preamp must have been good.

Those 20 preamplifiers funded the company, no bank required. One of them made its way to a prominent Berlin hi-fi dealer, where a prominent critic for a prominent hi-fi magazine noticed it. (Getting noticed by a critic for a well-known hi-fi magazine is, as we all know, the key to success in this industry.) The following year—1978—Burmester GmbH was founded.

Told from this perspective, the next theme of the story—Burmester's third fundament—is the high-end thing. When it comes to luxury-class hi-fi, Burmester is no Johnny-come-lately. Burmester products were *always* expensive.

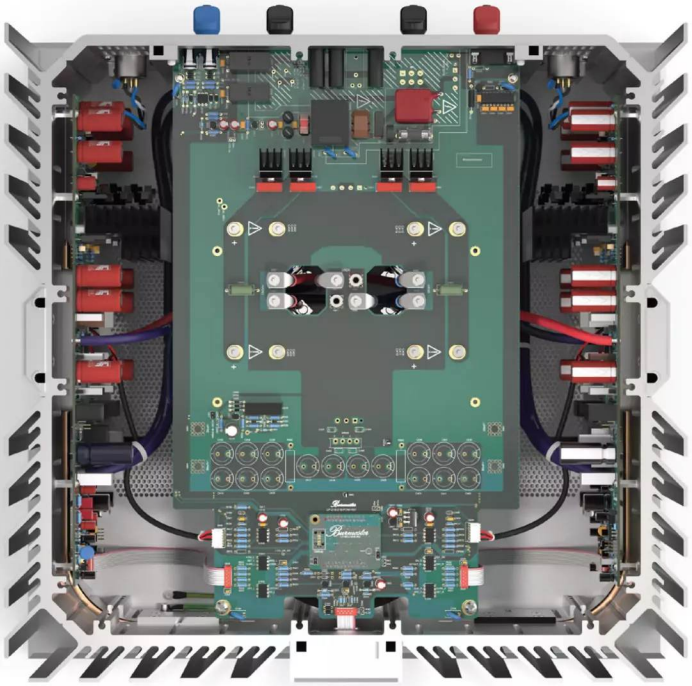
For a while, preamplifiers remained at Burmester's core. The company's second product, the 785, was also a preamplifier. It was quite different from its predecessor, smaller and simpler. The 777 had many knobs—tone controls, which could however be bypassed for those seeking purist sound. The 785 had separate left-and-right level controls—a balance control, in effect—plus the essentials: volume control and source selection. It was a bare-bones preamplifier.

From the 777 to the 785, the change with the most long-term significance was aesthetic: The 777 had a striking gold finish. The 785 was silver with a mirror finish. That finish became the company's aesthetic signature. I've never asked, but I suspect the finish was intended to send a message. "Transparency" isn't quite the right word—mirrors aren't transparent—but it's close: Burmester products reflect back at you whatever is on the recording.

Those early preamps, then, established the company's value system.

What about amplifiers?

Burmester's amplifier legacy is newer and less well-documented than that preamp-based origin story.



The first Burmester amplifier I recall knowing about was the 909, introduced in 1990. The 909 was quickly followed by the 911. Both were stereo. Simon Pope, who handles press relations for Burmester, told me that two amplifiers preceded these, both monoblocks: the 828 and the 850. The 850 was unique in that it came in two versions, one for speakers with nominal impedance of 4–8

MEASUREMENTS

The Burmester 216 can be operated as a conventional two-channel amplifier or, by bridging the two output stages using the supplied adapter cable, as a monoblock. I performed a complete set of measurements in both modes on one of the review samples (serial number 9216060) with my Audio Precision SYS2722 system.[1] I preconditioned the 216 by following the CEA's recommendation of running it in stereo mode at one-eighth the specified power into 8 ohms for 30 minutes. At the end of that time, the temperature of the top panel was 96.4°F (35.8°C) and that of the side panels 110.2°F (43.4°C).

The diagram on the amplifier's rear panel indicates that the balanced inputs are wired with pin 2 negative, the opposite of the AES standard. Consequently, the Burmester inverted absolute polarity in both stereo and mono modes. The 216's input impedance was a low 2800 ohms from 20Hz to 20kHz. The voltage gain in stereo mode at 1kHz was 31.7dB, which is equivalent to a sensitivity of 735mV input for full power. The gain in mono mode increased by just under the expected 6dB, to 37.5dB.

The output impedance in stereo mode, including the series impedance of 6' of spaced-pair cable, was 0.08 ohms at 20Hz

1 See stereophile.com/content/measurements-maps-precision.

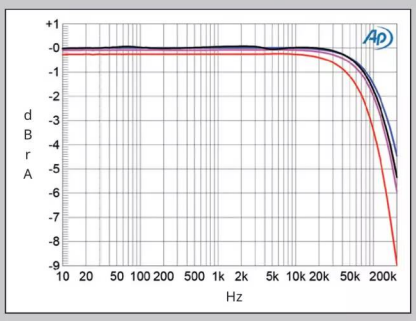


Fig.1 Burmester 216, mono mode, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (blue), 4 ohms (magenta), and 2 ohms (red) (1dB/vertical div.).

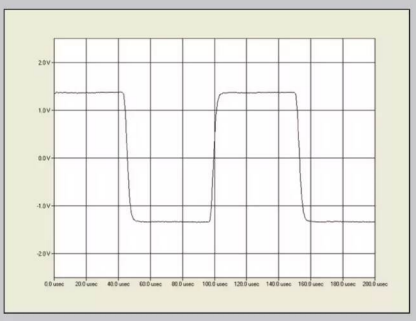


Fig.2 Burmester 216, mono and stereo modes, small-signal 10kHz squarewave into 8 ohms.

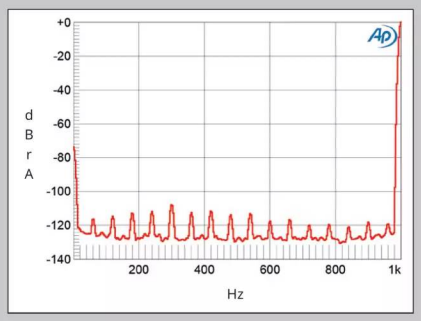


Fig.3 Burmester 216, mono mode, spectrum of 1kHz sinewave, DC–1kHz, at 1Wpc into 8 ohms (linear frequency scale).

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ohms, another for 10–20 ohms. In an email, Pope described these early amplifiers as "aesthetically quite quirky" and said they "bear little resemblance to current products in the way that the 909 does."

The 909, then, was the origin of modern Burmester-amp DNA, while the smaller 911, introduced two years later, is the obvious ancestor of the amplifier under review, the 216, although there was a model in between, the 956.

The immediate predecessor of the 216, though—the 216's daddy—was the Burmester 159.

The kick inside

What this means in terms of technical design—circuit topology and so on—isn't completely clear. Pope took several of my more technical questions back to Burmester's engineering department, which sent back answers. Those answers are informative even if they don't quite add up to a whole, simple, technical story. Certain design principles are clear. Burmester believes in balanced/symmetrical design, direct-coupled input to output. The 216 possesses those attributes.

When I asked what had changed from the previous generation—from the 159—the first point made by the engineering team had to do with the "thermal concept," referred to elsewhere as the "cooling concept." In the 216, "there are now universal heat pipes that allow us to keep temperatures constant and low at any point within the cabinet. These allow for better thermal management, which gives us more freedom in design and helps [increase] the lifespan of the power amplifiers."

Other changes have resulted from the availability of new technologies, such as the microcontroller used in the protection circuit, which allows operation to be monitored from outside the signal path. "This allows us to achieve the operational reliability expected from a Burmester power amplifier that can easily handle difficult loads and creates effortless power delivery."

Documentation I received includes a few other interesting details, such as "silver cable in the input section." Silver has higher conductivity than copper, but the difference is very small. Many claim that silver has a characteristic sound; some like it, others don't. Certainly silver is consistent with the Burmester design aesthetic.

Other points from the design brief apply to both the 216 and its 218 big brother: They must be bridgeable to mono. They must remain short enough to fit on a standard component rack, since that's where many customers will want to put a stereo amplifier, in contrast to monoblocks, which can happily sit on amplifier stands.

The new amplifiers incorporate Burlink, which, the internet says, is either the shuttle service run by Burlington County, New Jersey, or Burmester's proprietary system for interconnection and control. I'm betting on the latter. A remote-control On/Off function was implemented with the new amplifiers, as was an Auto-Off feature. Features like this are at once unimportant and, in the new world we live in, obligatory.

What else should I say about the 216 before I start listening to it? It doesn't heat up my listening room much at idle, and it doesn't run up my electric bill as much as some other amplifiers have, even with two of them running, bridged for mono. I conclude from this that the output stage operates in class-AB.

The Burmester website lists basic specifications, like power output; some others appear in the owner's manual. I've placed these in the Specifications sidebar. Here are some of the important ones. In stereo, the 216's maximum output power is 100Wpc continuous into 8 ohms, 165Wpc into 4 ohms, and 245Wpc into 2 ohms. Continuous power when bridged to mono is quoted only as a maximum: a formidable 490W—no load impedance mentioned. In response to a query, Pope told me it was safe to report that when

measurements, continued

and 1kHz, 0.1 ohms at 20kHz. The mono mode impedances were similarly low. As a result, the variation in the frequency response with our standard simulated loudspeaker[2] (fig.1, gray trace) was minimal. The response into resistive loads was flat in the audioband, not reaching –3dB until 150kHz into 8 ohms (blue) and 130kHz into 4 ohms (magenta). In mono mode, the ultrasonic response into 2 ohms (red) rolls off a little earlier than it did into higher impedances and in stereo mode, the –3dB point lying at 91kHz. With its wide small-signal bandwidth, the Burmester's reproduction of a 10kHz squarewave into 8 ohms featured very short risetimes in both modes (fig.2), with no overshoot or ringing.

Channel separation in stereo mode (not shown) was >80dB in both directions below 1kHz and still 70dB at the top of the audioband. In stereo mode, the unweighted, wideband signal/noise ratio (ref. 1W into 8 ohms), taken with the input shorted to ground, was a superb 85.4dB in the left channel, 82.9dB in the right. These ratios respectively improved to 95.2dB and 93dB when the measurement bandwidth was restricted to the audioband, and to 98dB and 95.5dB when A-weighted. The ratios were equally superb in mono mode. Spectral analysis of the low-frequency noisefloor while the Burmester drove a 1kHz tone at 1Wpc into 8 ohms in mono mode revealed that while power supply–related spuriae

2 See stereophile.com/content/real-life-measurements-page-2.

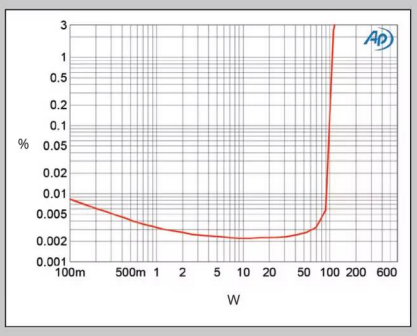

Fig.4 Burmester 216, stereo mode, distortion (%) vs 1kHz continuous output power into 8 ohms.

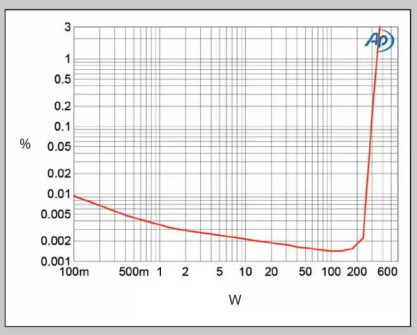

Fig.5 Burmester 216, mono mode, distortion (%) vs 1kHz continuous output power into 8 ohms.

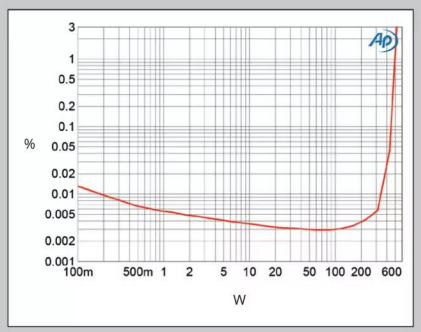

Fig.6 Burmester 216, mono mode, distortion (%) vs 1kHz continuous output power into 4 ohms.

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bridged, the 216 is capable of doubling the stereo output. For more on the 216's technical performance, see the Measurements section.

Regarding that relatively modest power specification: Experience convinces me that power needs are consistently overestimated. As I write this, I'm listening with a different amplifier, which possesses an accurate power meter, with the same speakers I have used to audition the 216, the Wilson Audio Specialties Alexx Vs. I'm achieving 80dB average listening levels with less than 10W. The "cruising" level for this system for serious listening—not background levels—seems to be around 30W, with slightly higher peaks. At 100W, I'm consistently exceeding 95dB; I would not want music any louder. At this level, with nominal 4 ohm speakers like these, the Burmester 216 has power in reserve.

On the other hand, these Wilsons, while not an easy load impedance-wise, are quite sensitive. With less-sensitive speakers, it is possible you'd need more power.

There's a second way in which power requirements are overestimated. Even when you have, on paper, too little power, the results can still be satisfying.

A frequent misunderstanding is that maximum power affects bass response even at modest listening levels. Theoretical power limitations have no effect on the sound until the power runs out.

Setup

There's not much to say in this section except that Burmester sent along *two* 216s. With the assistance of Pope, who stopped by for a visit, I installed them in my system this way (as monoblocks) in place of the previous monoblocks, two Pass Laboratories XA60.8s—and cabled them up. I had at least one (and often two) Burmester 216 amplifiers in my system for the better part of a year, removing them occasionally to listen to a different amplifier for a while or to send them off to a Burmester dealer for an event. I became very familiar with the sound of these amplifiers, in stereo and monoblock configurations. Everything else you need to know about setup, you can find in the Associated Equipment sidebar.

Listening

There's an irony inherent in high-end power amplifiers: You pay a lot to get as little as possible—as little character, that is. This is how it should be in principled hi-fi, and it's often how it *actually* is. That's one of the things I respect about this hobby. Sure, some folks are aiming to impress their friends with something that catches their attention, but the true enthusiast—and there are plenty of them out there—wants a system that gets out of the way of the music, and they're willing to pay to get it.

This must cause marketers at high-end audio companies serious headaches. How do you stand out from the crowd when the goal is to hide? What other business can you think of where the goal is to make the product disappear?

For an audio reviewer, too, this presents a challenge. What do you write about when the component under review has no sound?

That said, every audiophile has particular sensitivities, things

measurements, continued

at 60Hz and its harmonics were present, these all lay at or below –110dB (fig.3).

Burmester specifies the 216's maximum power in stereo mode as 100Wpc into 8 ohms (20dBW), 165Wpc into 4 ohms (19.17dBW), and 245Wpc into 2 ohms (17.9dBW). With our usual definition of clipping, which is when the THD+noise reaches 1%, the 216 met its specified power with both channels driven into both 8 ohms (fig.4) and 4 ohms (not shown). I didn't examine the clipping power into 2 ohms, as Jim Austin hadn't finished his auditioning and this sample had to be returned to him. (Amplifiers sometimes break when driving their maximum power into 2 ohms, which is why I usually leave this test to last.) In mono mode, the Burmester clipped at 330Wpc into 8 ohms (25.19dBW, fig.5) and 500Wpc into 4 ohms (24dBW, fig.6).

Even at high powers, the distortion below waveform clipping in figs.4–6 was very low. I examined how the percentage of THD+N varied with frequency at 20V, which is equivalent to 50W into 8 ohms, 100W into 4 ohms, and 200W into 2 ohms in both stereo (not shown) and mono (fig.7) modes. The THD+N percentage was higher into 2 ohms (red trace) than it was into the higher impedances (blue and magenta

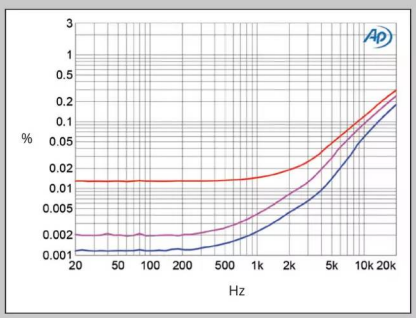


Fig.7 Burmester 216, mono mode, THD+N (%) vs frequency at 20V into: 8 ohms (blue), 4 ohms (magenta), and 2 ohms (gray).

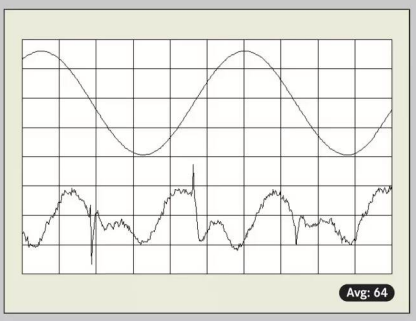
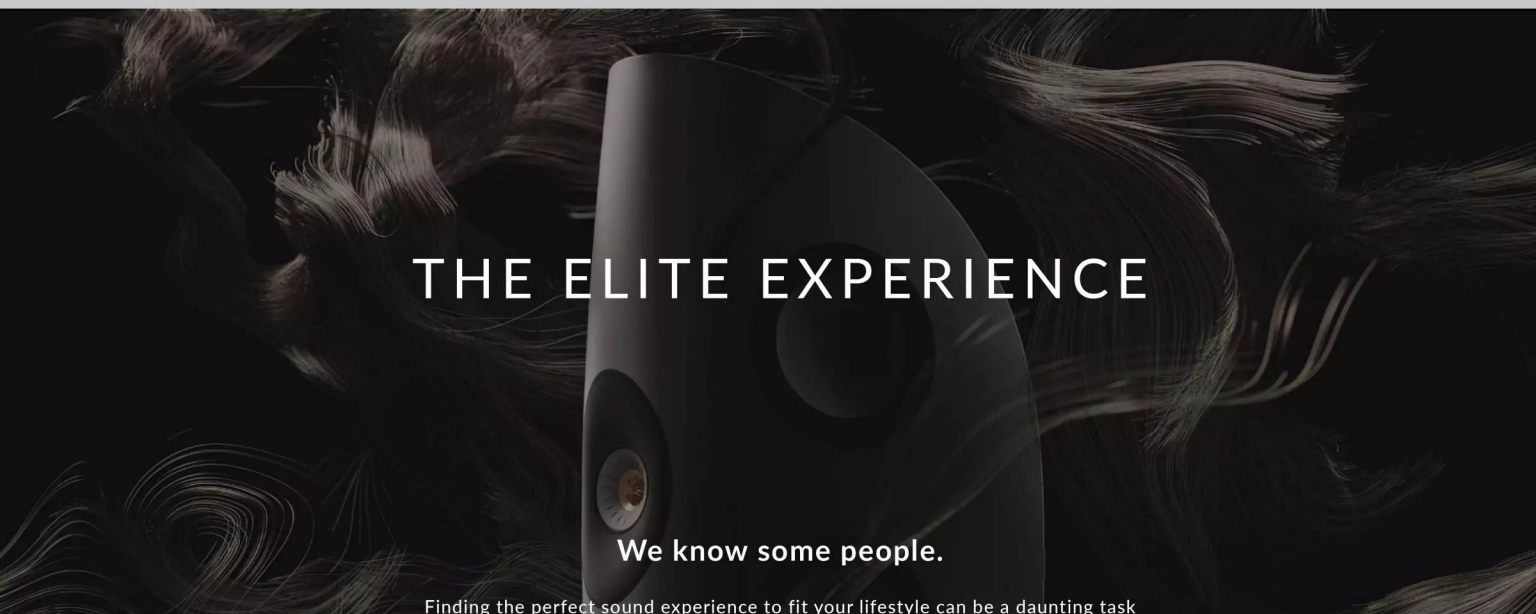


Fig.8 Burmester 216, stereo mode, 1kHz waveform at 50W into 8 ohms, 0.00127% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

Fig.9 Burmester 216, mono mode, 1kHz waveform at 50W into 8 ohms, 0.00194% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

KEF Listen and believe



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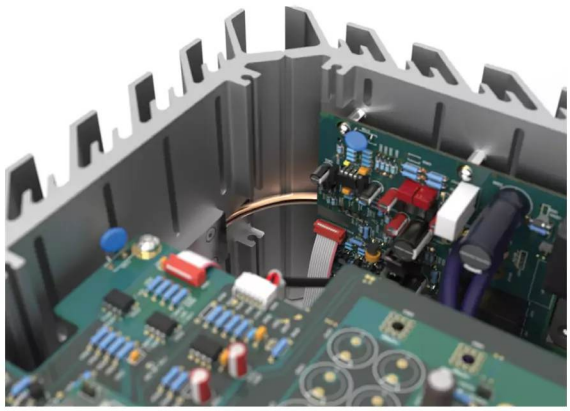
that especially bother them—and also *in*sensitivities, things other people hear easily and avoid that they are more or less immune to. I know that's true of me.

I won't talk about my insensitivities—not here—but a particular sensitivity of mine—and it is a useful one for a reviewer—is to the electrical character audio equipment can take on. Every amplifier—indeed, every element of an active hi-fi system—sounds like what it is: an electrical/electronic means of reproducing sound. But some components sound more electrical, some less.



Even if you were to completely eliminate electrical sound from your reproduction system, you wouldn't be rid of it. It remains on most recordings, which, after all, were also made electrically. If the electrical sound is there, your system should reproduce it, even if you don't want to hear it.

One of my main goals, as audiophile and reviewer, is to eliminate that electrical sonic overlay or reduce it as much as possible. I share this, probably, with many listeners and at least a few hi-fi designers. I'm convinced I share it with whoever at Burmester designed this amplifier.

In the strictest sense, this is only relevant for recordings of acoustical instruments. Anything else will sound electrical because it *is* electrical.

The absence of that electrical sound can greatly benefit any instrument, but I find it especially important on piano, acoustic double bass, and human voice. Still, I've found that the reproduction of electrical instruments—even synths—can be improved by banishing the electronicky overlay. I rather enjoy listening for the sound of the microphone on vintage vocal recordings—a good example is Ella Fitzgerald's *Let No Man Write My Epitaph*, songs from the film simply recorded with voice (and microphone) and Paul Smith on piano (24/96 FLAC, Verve/Qobuz). Add an extra electronic overlay from the reproduction system, and the distinctive sound of Ella's mike becomes more diffuse and troubling.

The more I can banish that electric sound from the best recordings of acoustic instruments, the happier I'll be. These Burmester amps do it as well as any amplifier I've had in my system. One could almost imagine them being powered not by electricity but directly by a windmill or something—maybe a monkey on a bicycle. I have no idea how that would work.

This is what I noticed first and most about the 216s after a bit of break-in, when I got serious about listening.

An album I've listened to a lot since its early-July release is *Mozart Recital* by Su Yeon Kim on the (obviously) piano-centric label Steinway & Sons. I'm enjoying it mostly for the music: It's a fascinating program with some unfamiliar Mozart, and this young pianist has a definite point of view, in the best way. Her touch is simultaneously warm and precise, and she plays with humor. The first thing that caught my ear was the opening Gigue, "Eine kleine Gigue" in G, K. 574. The way she plays it, it took a while for me to recognize this as Mozart; at first I thought it was by some modernist.

Joshua Frey, the recording engineer, has endowed the piano with a lovely sound but a perspective that's difficult to judge. It's

measurements, continued

traces), but was still low. The increase in THD+N in the top audio octaves will be due to the usual limitation in open-loop bandwidth reducing the amount of corrective negative feedback available.

The distortion waveform in stereo mode was predominantly the second harmonic (fig.8—I had to average 64 captures to reduce the level of the random noise to the point where the waveform of the distortion became clear.). However, spikes occur at the sinewave crossover points, and these were more fully developed at the same power in mono mode (fig.9). These spikes correlate with the presence of higher-order harmonics, which can be seen in spectra taken in both stereo (fig.10) and mono (fig.11) modes. Even so, the levels of the fifth and higher harmonics were extremely low, at close to –110dB (0.0003%). Intermodulation distortion was also very low, the 1kHz difference product resulting from an equal mix of 19 and 20kHz tones at 40W peak into 4 ohms lying at –104dB (0.0006%, fig.12). The rise in distortion in the top octaves seen in fig.7 results in higher-order intermodulation making an appearance in this graph, but the highest in level of these still lay at –90dB (0.003%).

The Burmester 216 offers very low distortion and noise and won't be fazed by having to drive low impedances.

—John Atkinson

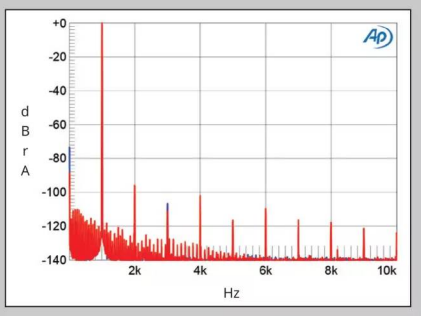


Fig.10 Burmester 216, stereo mode, spectrum of 1kHz sinewave, DC–10kHz, at 50W into 8 ohms (linear frequency scale).

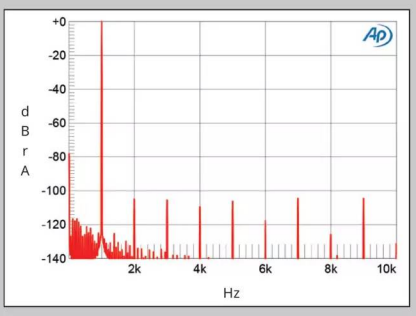


Fig.11 Burmester 216, mono mode, spectrum of 1kHz sinewave, DC–10kHz, at 50Wpc into 8 ohms (left channel blue, right red; linear frequency scale).

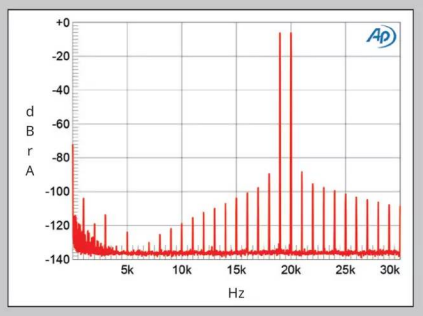
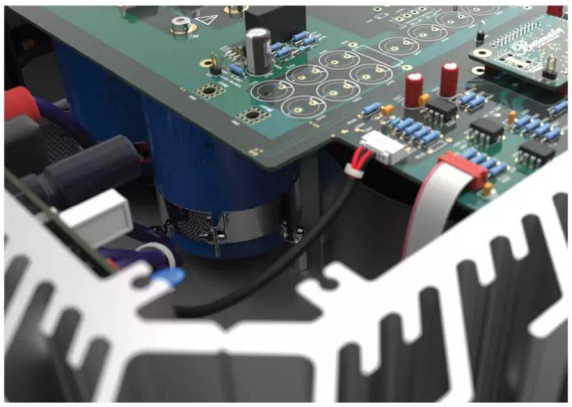


Fig.12 Burmester 216, mono mode, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 40W peak into 4 ohms (linear frequency scale).

a blend of up close and a few rows back. Notes are arrayed over a space that suggests the piano is perhaps 30' away, but the texture of the notes suggests close miking.

What did the Burmester 216s bring to the party?[1] Piano notes sounded weighty, full, dense. This is definitely a piano, with warmth and wood—none of the fortepiano sound one hears on some piano recordings. The leading-edge transient was fully there, to a degree I found quite natural, but the emphasis was on the rich core of the notes.



Scrolling through my most frequently played tracks in Roon, I chose *The Window* by Cécile McLorin Salvant (24/96 FLAC, Mack Avenue/Qobuz; later I listened to the LP, Mack Avenue MAC1132LP). This has become one of my reviewing standards; I've heard it many times on many systems. I have a good idea of what it sounds like.

This is a very fine recording. Cécile's voice is embodied, corporeal, present. The vocal mike is fairly neutral, so you don't notice it as much as you notice Ella's mike on *Epitaph*, though the microphone does take on an edge when her voice goes loud in her upper register. Sullivan Fortner's piano sounds very much like what it is, a piano in space, sounding mellow on some notes, percussive on others, depending on his touch.

Apart from the fact that I'm hearing reproduced music, which I would not be doing if there were no amplifier, I'm really not noticing the amplifier at all.

As good as the studio tracks on this album are, I think it gets better on the live numbers, recorded at the Village Vanguard. (My son was there for one of these performances; I should have been.) On Buddy Johnson's "Ever Since the One I Love's Been Gone," Cécile's voice is especially dynamic—edgy and in-your-face loud, which, naturally, you notice more at higher volume. The microphone is tangible; you're hearing not just the voice but voice plus microphone. The piano sounds a touch more solid and real on this and the other live tracks than it does on the studio tracks—more like Su Yeon Kim's recording of Mozart. Then comes "À Clef": Why is it that Cécile, whose voice often sounds aggressive and strange—that's a compliment; it's a big part of her talent—always sounds so lovely and feminine when she sings in French?

One of the great pleasures of a really fine music system is how it—or rather how the music, via it—can take you by surprise. I *should* leave this album and move on, but I'm finding that hard to do, because as I listen more, even this recording that I know so well continues to deliver surprises. On "Obsession," after Fortner's short introduction, Cécile's voice is exceedingly simple, soft, almost but not quite spoken word. It sounds a bit further back on the stage

1 I listened to this music over a rather long period of time via three different amplifiers: The Burmester, the Pass Labs XA60.8, and the CH Precision M1.1, which is in for review. My conclusions about what the Burmester brings is based on those comparisons.

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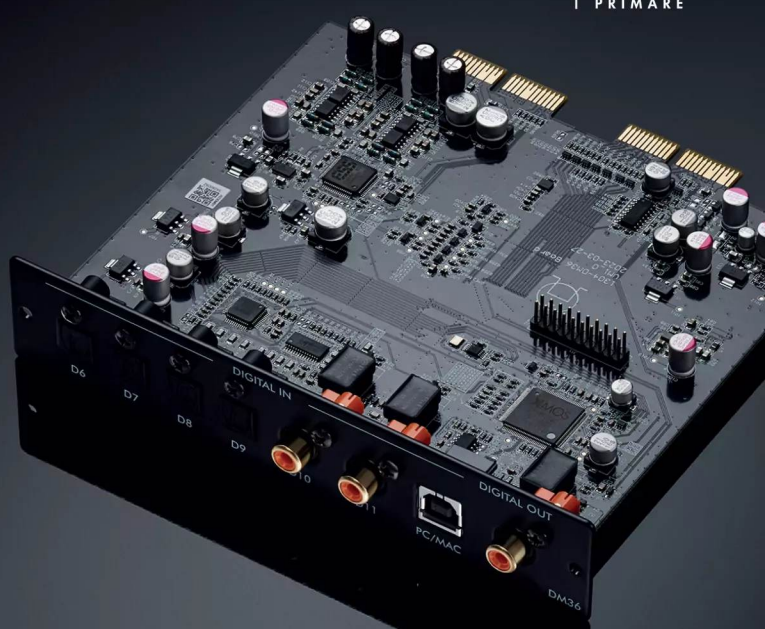

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now, surrounded by space, including front to back; the space surrounding her voice has space of its own.

An audio system is a facilitator. It's the *music* that affects us. The system has to *let it* affect us, and sometimes it doesn't. It's that disappearing thing again, and the 216s are doing it—disappearing, leaving lovely music in their wake, except that there is no wake, or none to speak of.

It's time for me to rip myself away from this lovely album and move on to something else—but not far. I'm moving to another album by Cécile, who followed up three consecutive Grammy-winning albums on Mack Avenue by moving to a new label—Nonesuch—and going more experimental. She put together a band with fascinating instrumentation: voice; exotic plucked strings (plus guitar); three varieties of bass (electric, synth, acoustic); flute; piano and Rhodes; percussion. The result is a totally new sound that, when I first heard it, just sounded strange. It took several listens (and three live performances: one at Princeton's McCarter Theatre Center and two at Jazz at Lincoln Center's Rose Theater) to adjust to this new soundscape. I am now well-adjusted.

Using Roon's remote—my laptop—I clicked on the first track.

Many people of a certain age fell in love with Kate Bush when she was young and we were, too. She released her debut album, *The Kick Inside*, when she was 19. "Wuthering Heights" is the last track on side 1 of that LP, and it's the first track on this album. It was brilliant there. It is better here. Cécile's take is profoundly different—how could it not be?—yet similar in spirit. We hear Cécile's distant voice in an echo chamber, growing ever closer, singing Baroque style with much ornamentation, then she starts into the first stanza. At the refrain, Paul Sikivie's synth bass starts up and her voice snaps forward—cue the goosebumps. Just now I played it twice—goosebumps both times. Then I let the album keep playing.

Listen to "Until ...," by Sting, from the soundtrack to the movie *Kate & Leopold*, and tell me this song doesn't belong in the great American songbook. This recording is so rich yet so chalk-dry—dry in the sense of the total absence of that electronic overlay I mentioned earlier—that it made me look up and smile big. Really good hi-fi can make you feel foolish.

It's happening again: I'm being distracted by the music. That could be this review's take-away.

One amp or two?

The last thing I did before finishing up this review is cue up the fourth movement of Mahler's Symphony No.2, "Resurrection." I cued up the fourth movement because I wanted to hear the fifth but didn't want to dive right into it. The start of V is one of the most sudden and intense musical climaxes I could think of. (I love that this climax comes at the beginning—the beginning of the last movement, the beginning of the end.) The five-minute, 48-second fourth movement ("Urlicht") was just a lovely lead-in to the fifth. I had just one amplifier playing in stereo, so the specified maximum power into the Wilsons, a nominal 4 ohm load, was 165W. I listened to IV and V all the way through. I listened especially carefully to the climax just after 11:20, which is a little bit louder than the one at the beginning but not as broadband. And because I listened through to the end, I also experienced the fifth movement's cataclysmic last few minutes. I listened loud, with peak levels in excess of 95dB.

Then I bridged the one amp, added the other one (also bridged of course), matched the volume electrically, and listened again.

I had already written this section in my mind. I was convinced by the analysis presented early in this review—that a single amplifier had sufficient power to drive these speakers to completely satisfying levels. Sure, I realized power isn't the only technical advantage to monoblock amplifiers. The amps no longer share a transformer, and the circuits are farther apart and separately shielded. All that boils down mainly to a single measurement—channel separation, or crosstalk. Presumably the channel separation is already excellent—so how much difference could this really make?

What I heard surprised me. Playing this powerful, broadband music very loud, with a single stereo amplifier, it sounded louder, more compressed, less controlled. With two amplifiers, bridged, the music spread out more and seemed more relaxed. It didn't seem as loud. The difference wasn't subtle. Listening with two amplifiers was a more satisfying experience.

What's going on? I don't know. Subjectively, I'd describe it as a relative absence of congestion. Was it the channel separation aiding imaging, better separating the various orchestral parts? I have noticed with certain "spatial" or immersive-audio formats that by better separating images in space, a greater sense of relaxation can be achieved. Maybe it's the channel separation. Maybe it's the power. Maybe it's some other thing.

I should add, this isn't the only time I noticed an improvement with these amplifiers bridged. Bridged often offered small advantages in image separation—images spread out further, side to side and front to back, within a larger yet more precise soundstage.

Conclusions

Criticisms? The Burmester visual aesthetic will not please everyone—you know who you are. It grew on me over time. It's not that I became a bigger fan of mirror finishes; it's that I came to notice the small, mirrored part less and to appreciate its classical form more. It has a bit of a Parthenon look.

The limitations of the Burmester 216 are those you can read about in Specifications. Do they have enough power to drive your loudspeakers? There's a good chance they do, since they are fairly powerful, though more powerful amplifiers are available, including the Burmester 218. Or, if you need more power and can pay the price, you can buy two 216s and use them bridged.

This may be the most self-effacing amplifier I've reviewed. Its utter lack of electronic character is a huge plus. It's a musical chameleon. I wrote a lot about music in the paragraphs above and not so much about amplifiers. It's the best I could do. Because of its reticence—how it consistently refused to take center stage—to *not* write about this amplifier is perhaps the best way to write about this amplifier. Highly recommended. ■

ASSOCIATED EQUIPMENT

Analog sources SME 30/12 turntable; Ortofon Windfeld Ti cart.
Digital sources CH Precision D1.2 D/A converter with X1 power supply. Roon Nucleus+ Roon server; Synology DS918+ 4-bay Network Attached Storage device with 16TB.
Preamplification CH Precision L1 and Pass Labs XP-32 line preamplifiers; Pass Laboratories XP-27 phono preamplifier.
Power amplifiers CH Precision M1.1 stereo amplifier; Pass Labs XA60.8 monoblocks.
Loudspeakers Wilson Audio Specialties Alexx V.
Cables Digital: AudioQuest Carbon & Cinnamon & Coffee (all USB); Nordost Valhalla 2 (Ethernet). Interconnect: Burmester (XLR), Nordost Valhalla 2, AudioQuest. Speaker: AudioQuest Thunderbird ZERO. Power: Burmester, Nordost Valhalla 2, AudioQuest Tornado High-Current C13, NRG-X3, and Monsoon.
Accessories PS Audio Power Plant P10 power conditioner; Melco S100 and Silent Angel Bonn N8 Pro Ethernet switches; Butcher Block Acoustics RigidRack, IsoAcoustics and Magico footers.—**Jim Austin**

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JOHN ATKINSON

Q Acoustics 5040

LOUDSPEAKER

When I reviewed the Concept 50 loudspeaker from the UK's Q Acoustics in August 2022,[1] I concluded that the Concept 50 lowers the sweet price spot for affordable tower speakers to $3000/pair. Now I have another pair of Q Acoustics loudspeakers in the house for review. Like the earlier speaker, the 5040 is a slim, elegant-looking tower with a vertical D'Appolito drive-unit array comprising a 0.9" fabric-dome tweeter positioned between the two 5" plastic-cone woofers. But the price is half that of the Concept 50: $1499/pair. Will this be a new sweet spot? We shall see.

The 5040

Superficially, the 5040 appears identical to the Concept 50, with twin height-adjustable spikes at the front and stabilizing aluminum outriggers at the rear. But it is slightly shorter and lacks the earlier speaker's sprung base. The three drive units are mounted at the top of the High-Density Fiberboard baffle on a panel finished in black acrylic and isolated from the enclosure with a layer of butyl rubber. The enclosure is made from 18mm MDF and, as with the Concept 50, Q Acoustics has paid a lot of attention to the cabinet's vibrational behavior. Strategically placed Point-2-Point (P2P) internal bracing stiffens the cabinet to minimize low-frequency vibrations, while two tubes, called Helmholtz Pressure Equalisers (HPE), are said to reduce the effects of internal standing waves.

The proprietary drive units were developed for Q Acoustics's 5000-series models. The woofers' plastic cones are terminated with a substantial half-roll surround and feature what Q Acoustics calls a "Continuous Curve Cone" profile,[2] which doesn't have a conventional dust cap. This cone was developed using Finite Element Analysis (FEA) and is said to combine the bass-performance benefits of a traditional straight conical cone with the midrange frequency control of a flared cone while reducing harmonic distortion. The dispersion and what is described as "a well-controlled frequency response" should enable a smooth integration with the tweeter. The woofer's motor uses a substantial magnet with a near fully saturated pole piece and an aluminum ring mounted underneath the pole plate to reduce inductance-induced modulation distortion. The 30.5mm voice-coil is wound from low-mass copper-clad aluminum wire (CCAW) over a glass

1 See stereophile.com/content/q-acoustics-concept-50-loudspeaker.

2 A white paper on the technology featured in Q Acoustics's 5000-series loudspeakers can be downloaded from tinyurl.com/3c4m9du8.

SPECIFICATIONS

Description Two-way, reflex-loaded, floorstanding loudspeaker. Drive units: two 5" (125mm) impregnated-and-coated-paper–cone woofers; 1" (25mm) fabric-dome tweeter. Crossover frequency: 2.5kHz. Frequency response: 39Hz–30kHz –6dB. Nominal impedance: 6 ohms. Minimum impedance: 3.0 ohms. Sensitivity: 91.5dB/2.83V/m. Recommended amplifier power: 25–150W. Supplied accessories: foam port-blocking plugs, aluminum stabilizers, carpet-piercing spikes, and protective spike covers.
Dimensions 38.1" (967mm) H × 11.5" (293mm) W × 14.2" (361mm) D including spikes and stabilizer. Effective volume: 27l. Weight: 39.7lb (18kg) each.
Finish Satin Black, Satin White, Santos Rosewood, Holme Oak. Black acrylic trim around drive units.
Serial numbers of units reviewed QA5044 032300 114 & '012300 155. "Designed and engineered in the UK. Made in China (PRC)."
Price $1499/pair. Approximate number of US dealers: 30; also sold direct. Warranty: 4 years, extended to 5 years if purchase registered online.
Manufacturer
Q Acoustics,
Unit 2, Woodside,
Bishop's Stortford CM23 5RG,
England, UK.
Tel: (855) 279-5070.
Web: qacoustics.com.

fiber former.

The woofers are reflex-loaded with a port 11" from the floor on the speaker's rear and cross over to the tweeter at 2.5kHz. This unit was developed from the Concept series tweeter. It is hermetically sealed to prevent modulation by internal pressure variations and mechanically isolated from the front baffle. The cloth diaphragm has a narrow concave roll surround and is loaded with a shallow waveguide.

Setting up

I used my Roon Nucleus+ to feed audio data over my network to an MBL N31 CD player/DAC, which was connected first to the Musical Fidelity Nu-Vista 800.2 integrated amplifier I reviewed in the December 2023 issue, then, later, to the Audio Research I/50 integrated amplifier I reviewed in September 2023. Finally, I hooked it up to my NAD M10 integrated amplifier. The Q Acoustics 5040 has a single pair of binding posts at the bottom of the rear panel. I single-wired each speaker with AudioQuest Robin Hood cable.

With the 5040s sitting on their spikes and outriggers—protective spike covers are provided for those who have wooden floors—the tweeters were 30" from the floor, which is a few inches below my ear height. However, a D'Appolito driver array optimizes the vertical dispersion so that the tweeter-axis response is maintained a few degrees above and below that axis while floor and ceiling reflections are reduced in level. Listening to the dual-mono pink noise track on my *Editor's Choice* CD (Stereophile STPH016-2; no longer available), I didn't hear any

MEASUREMENTS

I used DRA Labs' MLSSA system, a calibrated DPA 4006 microphone, and an Earthworks microphone preamplifier to measure the Q Acoustics 5040's quasi-anechoic behavior in the farfield. (The 5040's manual doesn't mention an optimal listening axis, so I examined the farfield frequency- and time-domain responses on the tweeter axis.) I used an Earthworks QTC-40 mike for the nearfield and in-room responses and Dayton Audio's DATS V2 system to measure the impedance magnitude and electrical phase angle.

Q Acoustics specifies the 5040's voltage sensitivity as a high 91.5dB/2.83V/m. My estimate, calculated by comparing the SPL at 50" of the 5040 with that produced by a Rogers LS3/5a,[1] was within experimental error of the specified figure, at 91.7dB(B)/2.83V/m. The 5040's impedance is specified as 6 ohms, with a minimum value of 3 ohms. With the port on the rear panel sealed with the supplied foam plug, the impedance was typical of a sealed enclosure, with a relatively high tuning frequency of 69Hz. With the port open, the impedance magnitude (fig.1, solid trace) varied between 4 ohms and 13 ohms over most of the audioband, with minimum values of 3.7 ohms at 560Hz and 2.91 ohms at 8.7kHz. The electrical phase angle (dotted trace) is often high, reaching –53° at 96Hz and +37° at 1084Hz. As a result, the effective resistance, or EPDR,[2] lies below 3 ohms over much of the audioband, with minimum values of 2 ohms between 131Hz and 210Hz, 1.79 ohms at 836Hz, and 1.35 ohms at 5.8kHz. This loudspeaker is a difficult load.

When I investigated the enclosure's vibrational behavior with a plastic-tape accelerometer, I found a resonant mode at 285Hz that was present on all the panels. Its amplitude was lowest on the front baffle below the drive units and strongest on the rear panel (fig.2). This mode has a relatively high Q (quality factor) and its frequency lies between the notes C# and D in the equal-tempered scale. Both these factors will reduce the possibility of this resonance having audible consequences. (A resonance needs to be stimulated at its exact frequency by the same number of

1 Every time I measure a loudspeaker, I also measure one of my 1970s-vintage LS3/5a's to make sure that a systematic error hasn't occurred.

2 EPDR is the resistive load that gives rise to the same peak dissipation in an amplifier's output devices as the loudspeaker. See "Audio Power Amplifiers for Loudspeaker Loads," *JAES*, Vol.42 No.9, September 1994, and stereophile.com/reference/707heavy/index.html.

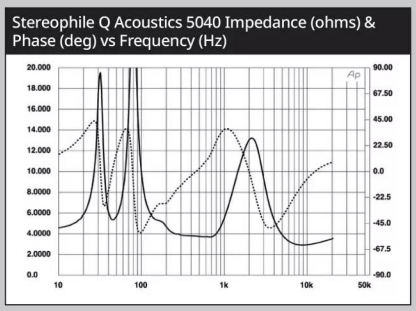

Fig.1 Q Acoustics 5040, electrical impedance (solid) and phase (dashed) with port open (2 ohms/vertical div.).

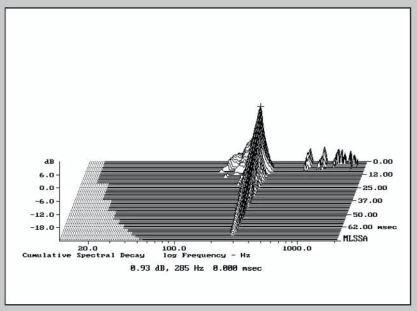

Fig.2 Q Acoustics 5040, cumulative spectral-decay plot calculated from output of accelerometer fastened to center of back panel (MLS driving voltage to speaker, 7.55V; measurement bandwidth, 2kHz).

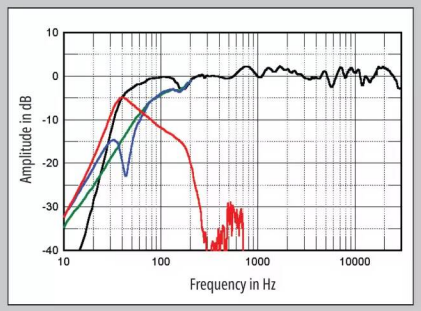

Fig.3 Q Acoustics 5040, anechoic response on tweeter axis at 50", averaged across 30° horizontal window and corrected for microphone response, with the nearfield responses of the woofers (blue), port (red), their complex sum (black), and the nearfield sealed-box woofer response (green), respectively plotted below 300Hz, 700Hz, 300Hz, and 300Hz.

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significant change in tonal balance if I slouched or sat up straight. The sound started to sound a little hollow if I rose to the point where I could see the top of the enclosure.

The manual recommends that the 5040s be positioned at least 0.2m (8") from the wall behind them, 0.5m (19.7") from the sidewalls, and 2–4m (78.7"–157") apart. As with the Concept 50s, the 5040s needed to be closer to the wall behind them than was possible in my room. (This is due to a short flight of stairs behind the right-hand speaker that runs up to the vestibule.) I therefore experimented with the speaker positions to give the most even midbass and upper-bass balance. The 5040's front baffles ended up 72" from the wall behind the speakers, which were 103" apart and 47" from the nearest sidewalls, though this distance was reduced at places by bookcases and record cabinets.

The manual also says that "turning the loudspeakers slightly inwards will sharpen the stereo image at the expense of a narrower sound stage." As I am a stereo imaging fanatic,[3] I toed each speaker in to the listening position. I left off the vestigial grilles for my auditioning.

Listening

With their ports open, the 5040s reproduced the 1/3-octave warble tones on the *Editor's Choice* CD cleanly down to the 40Hz band, with the 50Hz warble a little lower in level. The 32Hz tone was reinforced by the lowest room mode, but the 25Hz and 20Hz tones were inaudible. The warble tones sounded very clean, with no "doubling" (adding second-harmonic distortion). The half-step–spaced tonebursts on *Editor's Choice* spoke cleanly down to 60Hz, with those

3 See my 1981 article on stereo imaging at stereophile.com/content/stereo-image.

measurements, continued

cycles as its Q to be fully excited.)

The two woofers behaved identically. With the port open, their response, measured in the nearfield (fig.3, blue trace), has the expected minimum-motion notch at 43Hz. The red trace in fig.3 shows the nearfield output of the port; it peaks slightly below the tuning frequency and its upper-frequency rollout is clean, with an increase in the low-pass rate above 170Hz. With the port sealed, the response of the woofers (fig.3, green trace) gently rolls off below 100Hz. Both the woofers' response and the complex sum of the woofer and port responses (fig.3, black trace below 300Hz) have a small suckout centered at 173Hz. This coincides with the frequency at which the port's rolloff increases, suggesting that some sort of internal anti-resonance is present. As with the Concept 50,[3] there is little sign of the usual peak in the midbass region due to the nearfield measurement technique, which assumes that the drive units are mounted in a true infinite baffle. The speaker's reflex alignment is therefore overdamped, which implies that the speaker will give the highest low-frequency output when it is placed relatively close to the wall behind it.

The black trace above 300Hz in fig.3 shows the 5040's quasi-anechoic farfield response, averaged across a 30° horizontal window centered on the tweeter axis and taken without the grille. The response is relatively even overall, though there is a slight shelf in the upper midrange and low treble. The pair matching between the two samples was excellent, the difference in the farfield response falling within ±0.25dB limits from 1kHz to 15kHz. The response with the grille (not shown) was very similar in the audioband, other than introducing some small, narrow suckouts between 5kHz and 10kHz. The grille also reduced the level of the slight peak at 20kHz by 2dB.

Fig.4 shows the 5040's horizontal dispersion, normalized to the response on the tweeter axis, which thus appears as a straight line. The contour lines in this graph are even, though the radiation pattern narrows slightly at the top of the woofers' passband. The dispersion is wider in the region covered by the tweeter. Fig.5 shows the speaker's dispersion in the vertical plane, again normalized to the response on the tweeter axis. The response is maintained 5° above the tweeter

3 See stereophile.com/content/q-acoustics-concept-50-loudspeaker-measurements.

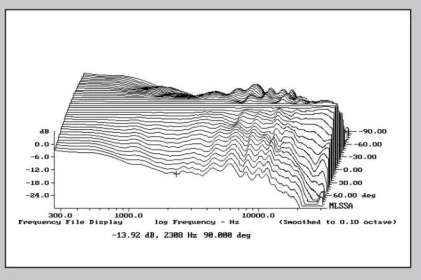

Fig.4 Q Acoustics 5040, lateral response family at 50", normalized to response on tweeter axis, from back to front: differences in response 90°–5° off axis, reference response, differences in response 5°–90° off axis.

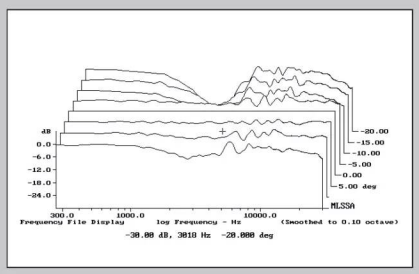

Fig.5 Q Acoustics 5040, vertical response family at 50", normalized to response on tweeter axis, from back to front: differences in response 20°–5° above axis, reference response, differences in response 5°–15° below axis.

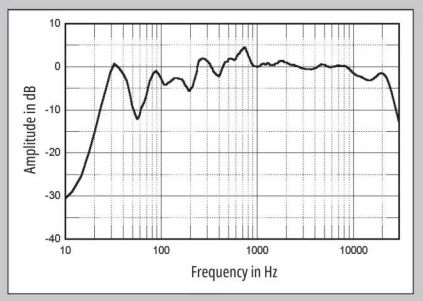

Fig.6 Q Acoustics 5040, spatially averaged, 1/6-octave response in JA's listening room.

lower in frequency suppressed a little and those between 2kHz and 4kHz slightly accentuated. Listening to the enclosure's walls with a stethoscope while the tonebursts played, I could hear a narrow band of liveliness between 250Hz and 300Hz on the rear panel. The side panels and front baffle were better behaved in this regard.

Though the 5040s were positioned farther out in my room than Q Acoustics recommends, the low frequencies had sufficient bass weight. The softly struck bass drum that punctuates Peter Gabriel's "My Body Is a Cage," from *Scratch My Back (Special Edition)* (24/48 MQA, Real World Productions/Tidal), was delivered into the room in what sounded to be full measure.

BBC Radio 3's *Night Tracks* program, streamed with Roon, alerted me to Corin, an electronica artist with whom I was completely unfamiliar. After an ambient choral beginning, the title track from her *Lux Aeterna* (24/44.1 FLAC, UIQ/Qobuz) features a sequence with high-level, low-frequency synth notes. The Q Acoustics had no problem playing this passage with sufficient authority—*not* what I was expecting from a pair of relatively inexpensive speakers with 5" woofers.

I was careful to keep the sound pressure level at the listening seat below 87dB(C), slow ballistics. These are 5" woofers, after all. Even so, the low-frequency downward sweeps on the synth on "Fit Song," from Cornelius's *Sensuous: la musique du 21e siécle* (16/44.1 ALAC file, ripped from CD, Everloving/Warner Bros. EVE016), were cleanly reproduced. And the drum samples on this track had excellent clarity.

At the other end of the spectrum, Cornelius's sampled cymbals had a little too much HF "swish." Was it the speakers? Was it the Musical Fidelity amplifier? Was it the recording? I played a track from the Jerome Harris Quintet's *Rendezvous* (16/44.1 ALAC file, STPH013-2), which I had recorded and mixed.[4] Billy Drummonds's cymbals on "Decision Point" also had a touch too much top-octave energy, more than I remember from when I listened to this track on the Q Acoustics Concept 50s and definitely more than with my reference KEF LS50s. I tried reducing the toe-in angle, as recommended in the manual, but this slightly blurred the stereo image.

As I had noted with the Concept 50s, Drummond's kickdrum and Harris's acoustic bass guitar were reproduced by the 5040s with excellent upper-bass articulation, even with the ports open. Also like the Concept 50s, the 5040s offered impressive clarity and excelled when it came to stereo-imaging accuracy. The dual-mono pink noise track on *Editor's Choice* was reproduced as a narrow, stable central image, with no splashing to the sides at any frequency and only some slight "vertical venetian blind" effect (comb filtering) as I moved my head from side to side. The soundstage on *Borders*, a new album of orchestral works by Norwegian composer

4 This CD is out of print but the files can be downloaded or streamed from jeromeharris.bandcamp.com/album/rendezvous.

measurements, continued

axis, which is useful considering that the tweeter is 30" from the floor. A suckout starts to develop in the crossover region 10° above the reference axis.

Fig.6 shows the Q Acoustics 5040s' spatially averaged response[4] in my room with their ports open and without the grilles. The response is reasonably even above 230Hz, though with a slight excess of energy in the upper midrange. There is insufficient upper- and midbass energy due, presumably, to the fact that I wasn't able to move the speakers as close to the wall behind them as necessary. Instead of the in-room response gently sloping down above 3kHz, which will be due to the increased absorption of the room's furnishings as the frequency increases, the 5040s' response remains at full level up to 9kHz.

For reference, the red trace in fig.7 repeats the spatially averaged response of the 5040s and adds that of the Q Acoustics Concept 50s (blue trace) and that of my long-term reference KEF LS50s (green trace). The two Q Acoustics speakers have a very similar in-room response in the bass, where the two models excite the lowest-frequency mode in my room to the same extent, and the midrange. However, the 5040s' spatially averaged response has more energy above 5kHz, while the Concept 50s' response was almost identical to that of the KEFs in this region.

In the time domain, the 5040's step response (fig.8) indicates that the three drive units are connected in positive acoustic polarity. The decay of the tweeter's step, which arrives first at the microphone, blends smoothly with the start of the woofers' step, which implies optimal crossover implementation. The 5040's cumulative spectral-decay plot on the tweeter axis (fig.9) features a clean initial decay. (As always, ignore the apparent low-level ridge of delayed energy just below 16kHz, which is due to interference from the MLSSA host PC's video circuitry.)

The Q Acoustics 5040 offers generally excellent measured performance. However, that demanding impedance might make amplifier choice problematic, and the extended high frequencies will mean experimentation with toe-in might be necessary to optimize the speakers' treble balance.—**John Atkinson**

4 Using the FuzzMeasure 3.0 program, a Metric Halo MIO2882 FireWire-connected audio interface, and a 96kHz sample rate, I average 20 1/6-octave–smoothed spectra, individually taken for the left and right speakers, in a rectangular grid 36" wide × 18" high and centered on the positions of my ears.

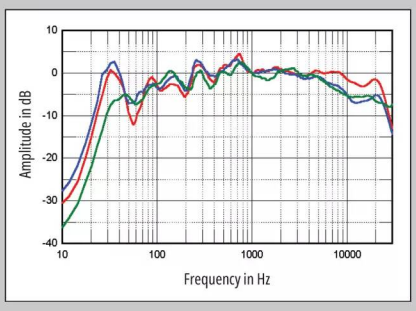

Fig.7 Q Acoustics 5040, spatially averaged, 1/6-octave response in JA's listening room (red), the Q Acoustics Concept 50 (blue), and of the KEF LS50 (green).

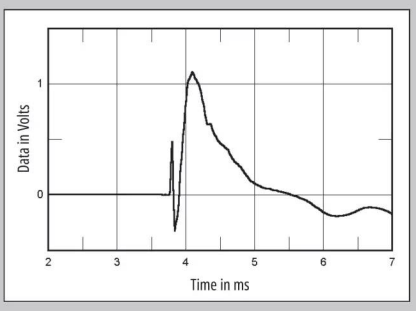

Fig.8 Q Acoustics 5040, step response on tweeter axis at 50" (5ms time window, 30kHz bandwidth).

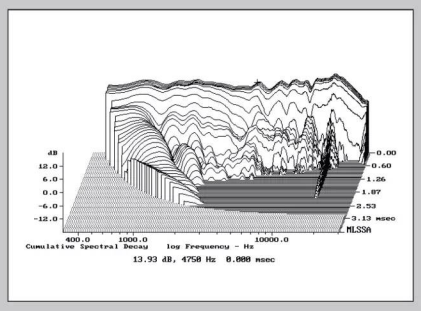

Fig.9 Q Acoustics 5040, cumulative spectral-decay plot on tweeter axis at 50" (0.15ms risetime).

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Henning Sommerro performed by the Trondheim Symphony Orchestra and conducted by Nick Davies (24/352.8 MQA, 2L 2L-173-SABD), was stable, wide, and deep. More significantly, the images of the individual instruments were superbly well-focused. The solo harmonica in the three movements of *Solkverv* (Solstice) was appropriately small. (Too many orchestral recordings exaggerate the size and loudness of the solo instrument—I am looking at you, Jascha Heifetz.)

It was time to return the Musical Fidelity amplifier to the distributor, so I replaced it with the Audio Research I/50 integrated amplifier. I used the I/50's 4 ohm output transformer taps, as I was already aware that the 5040 was a current-hungry load. (See the Measurements sidebar.) I played the Jerome Harris track again. The sound was sweeter than it had been with the Musical Fidelity—in fact it was *too* sweet. I measured the frequency response of one of the speakers while it was driven by the Audio Research and found that the 5040's output in the top octave was attenuated up to 5dB compared with the Nu-Vista 800.2. This was due to the fact that the I/50's output impedance rises to 2.3 ohms in the top octave and the Q Acoustics's impedance in the same region drops to 3 ohms.

Yes, the treble balance sounded overly sweet with this amplifier, but the Q Acoustics speaker's midrange was still impressively transparent. I played Mike Garson's arrangement of Miles Davis's "All Blues" from *Jazz Hat* (16/44.1 FLAC, Reference Recordings/Qobuz). Garson's piano sounded uncolored, though projected slightly forward in the soundstage. I confirmed this behavior with one of my own piano recordings, Robert Silverman performing Liszt's *Liebestraum* (16/44.1 ALAC, Stereophile STPH-008-2). Silverman's Steinway was superbly articulate, though its image was indeed more forward than I am used to, with some upper midrange notes slightly emphasized.

Nevertheless, the midrange reproduction and imaging precision of the Audio Research/Q Acoustics combo was addictive. The images of the vocal soloists on Eriks Esenvalds's "Translations," from the album of the same name from the Portland State Chamber Choir (24/96 WAV, Naxos), was palpable, and the wordless choral vocals that surround the solo singers were set well behind them.

I switched out the Audio Research for my NAD M10 integrated amplifier, using the NAD's own D/A stage rather than the MBL digital processor. The 5040's top octaves no longer sounded overly sweet, but they were not quite as emphasized as they had been with the Musical Fidelity Nu-Vista. Without the Nu-Vista's iron-fisted control of the speaker's low frequencies, bass instruments didn't sound quite as articulate, though they still had good weight as long as I didn't set the volume too high.

Listening to the Jerome Harris Quintet's *Rendezvous* reminded me that Art Baron, the trombonist on this album, had also been featured on "Love Having You Around" from Stevie Wonder's *Music of My Mind* (Motown). I finished my auditioning of the Q Acoustics 5040s by streaming *Music of My Mind* in 24/192 resolution from Qobuz, sticking with the NAD amplifier. The synth bass line was evenly balanced, the cymbals didn't sound too hot, Wonder's multitracked vocals were compelling, and when Art Baron's blatty-sounding 'bone takes flight around the 5-minute mark, the Q Acoustics 5040s transported me back 50 years to when this groundbreaking album was in heavy rotation *chez* Atkinson.

ASSOCIATED EQUIPMENT

Digital sources Roon Nucleus+ file server; Ayre Acoustics C-5xe^{MP} universal player; MBL N31 CD player/DAC; Ayre Acoustics QA-9 A/D converter; NetGear Nighthawk router.
Integrated amplifiers Audio Research I/50, Musical Fidelity Nu-Vista 800.2, NAD M10.
Power amplifiers Parasound Halo JC 1+ monoblocks.
Loudspeakers KEF LS50.
Cables Digital: AudioQuest Vodka (Ethernet), AudioQuest Coffee (USB), DH Labs (1m, AES3). Interconnect: Ayre/Cardas (balanced). Speaker: AudioQuest Robin Hood. AC: AudioQuest Dragon Source & High Current, manufacturers' own.
Accessories Target TT-5 equipment racks, Ayre Acoustics Myrtle Blocks; ASC Tube Traps, RPG Abffusor panels; AudioQuest Niagara 5000 Low-Z Power/Noise-Dissipation System (amplifiers) and AudioQuest Niagara 1000 Low-Z Power/Noise-Dissipation System (source components). AudioQuest Fog Lifters cable supports. AC power comes from two dedicated 20A circuits, each just 6' from breaker box.
Room 20' (left side), 25' (right side) × 16' × 8'.—**John Atkinson**

Conclusion

I wasn't sure what to expect from the Q Acoustics 5040. Other than the GoldenEar BRX, which costs $1900/pair, and the KEF LS50 Meta, which costs $1599.99/pair, the 5040 is the least expensive speaker I have reviewed in more than four years. The Q Acoustics is a tower speaker while those other two are standmounts, which means the cost of a pair of good-quality stands needs to be added to their prices. But even without taking its affordable price into consideration, Q Acoustics's 5040 offers superb sound quality. It combines sufficient low-frequency extension and articulation with excellent clarity and imaging and low coloration. As the 5040 won't play deafeningly loudly, it will work best in smallish to medium-sized rooms, and amplifier choice will be critical in getting the best from this speaker. Highly recommended. ■

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Naim NSC 222 & NPX 300

STREAMING PREAMPLIFIER & POWER SUPPLY

Naim has comprehensively reimagined its Classic Series, which has been around for some 20 years with improvements along the way. Included in the new range of products is the 200 series, comprised of two products: the NAP 250 power amplifier, which I reviewed in the November issue of *Stereophile*,[1] and the NSC 222 streaming preamplifier ($8999), which is reviewed here. A third component in the New Classic series, the NPX 300 power supply (also $8999), which is intended to be paired with the NSC 222 and other Naim components, is also considered in this review.

In brief, the NSC 222 is a line preamplifier sporting a precision, microprocessor-controlled, click-free, 100-step discrete-resistor volume stage, a medium-sensitivity moving magnet phono preamplifier, a comprehensive streamer/DAC that can be controlled with the matching Naim app, and a dedicated headphone amplifier. The fully loaded NSC 222 packs quite a punch in terms of facilities and features.

Continuing a Naim tradition, the NSC 222 streamer-preamplifier may be paired with the NPX 300 auxiliary power supply; for the seriously committed enthusiast, a second NPX 300 may be added to the system, providing the option of entirely separating the digital and analog domains. When one or more NPX 300 is installed, the mains-powered supplies inside the NSC 222 are disabled, removing interactions between the local transformer and the digital and analog components inside the NSC 222, including those resulting from radiated electromagnetic fields and core vibrations. Utiliza-

1 See stereophile.com/content/naim-classic-200-series-nap-250-power-amplifier.

SPECIFICATIONS

Description (NSC 222): Streaming digital/analog preamplifier. Analog inputs: (1) moving magnet phono; (1) eight-pin DIN, also compatible with five-pin cables; (1) pair RCA. Digital inputs: (2) TosLink (up to 24/96), electrical S/PDIF on BNC and RCA (up to 24/192 PCM or DSD64 via DoP). Outputs: one pair each XLR, RCA. One 6.35mm headphone jack. Digital formats supported: WAV, FLAC, ALAC, MP3, AAC, OGG, WMA, DSD, and M4A. Supports gapless playback in all formats. Network: Ethernet (10/100Mbps), Wi-Fi (802.11 b/g/n/ac). Power consumption: 25W typical, <2W network standby, 0.5W standby. Storage: Two USB Type A to connect HDD (max 1TB) or USB stick (max 128GB). (NPX 300): Auxiliary power supply to upgrade Naim components. Standby power consumption <0.5W
Dimensions (both units): 17" (432mm) W × 3 5/8" (91.5mm) H × 12 1/2" (317.5mm). Weight, NSC 222: 24.25lb (11kg); NPX 300: 31.75lb (14.4kg).
Finish (both units): Black aluminum alloy and black acrylic.
Serial numbers of unit reviewed 527129 (NSC 222); 525385 (NPX 300). Manufactured in Salisbury, UK, and elsewhere in Europe.
Price (each unit): $8999. Approximate number of US dealers: 22. Warranty: 2 years mechanical, 5 years electronics.
Manufacturer Naim Audio Ltd., Southampton Rd., Salisbury, SP1 3LN, England, UK. Tel: 44 (0) 1722 443405. Email: marketing@naimaudio.com. Web: naimaudio.com.
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tion of the external supply allows full electrical separation of the analog and digital sections within the unit. Two separate, high-performance, ring-locking umbilical cables link the auxiliary supply to the two internal sections of the streamer-controller.

This modular design approach allows the user to start with the basic component—the NSC 222—then advance to higher performance levels in logical steps without incurring redundancy.

The physical appearance of these components is classic Naim, with modest changes. The fascia is all black, with heavy sections of satin aluminum alloy flanking a heavy block of polished acrylic. On the far left is the large, illuminated volume knob/encoder, supporting a volume control that suppresses contact noise for smooth, silent operation and delivers a 100dB numeric range in 1dB steps up to 58 and smaller steps thereafter, via a precision discrete resistor ladder circuit, derived from the design from the flagship Naim Statement. To the right of the volume control is a standard 6.35mm ($^1/_4$") headphone socket and a Type-A USB socket for connecting an external storage USB stick. Next to that is the acrylic middle

MEASUREMENTS

I measured a different sample of the Naim NSC 222, serial number 519712, than that auditioned by Martin Colloms. Using my Audio Precision SYS2722 system,[1] I performed a complete set of tests with the preamplifier connected to the NPX 300 power supply. (The NPX 300 was sitting on the floor, as far away from the preamplifier chassis as the two umbilical cables allowed.) I then repeated some of the tests with the NSC 222 powered by its internal supply.

I connected the Naim to my router with an Ethernet cable, and when I powered up the preamplifier, it asked to be paired with the remote control. After I did that, it asked which language, country, and time zone I preferred, then checked that its firmware was up to date. It was: The preamp was running v5.0.2.7936. The Roon app running on my iPad mini recognized three versions of the NSC 222: as a Roon Ready device; as a Chromecast streaming device; and as an AirPlay streaming device. I activated the Roon Ready version and used that, along with the Audio Precision's optical and coaxial S/PDIF outputs, to send test-tone files to the NSC 222.

The Naim's optical S/PDIF input accepted data sampled up to 96kHz, the coaxial S/PDIF inputs accepted data sampled up to 192kHz. With Roon, the preamplifier accepted data sampled up to 384kHz. (I don't have any PCM files sampled at a rate higher than 384kHz.) The digital inputs preserved absolute polarity at the NSC 222's balanced, unbalanced, and headphone outputs. With the volume control set to its maximum, a 1kHz digital signal at –12dBFS resulted in an output level of 1.34V into 100k ohms from the balanced output and 3.156V from the unbalanced and headphone outputs. The balanced output impedance was a low 45 ohms at 1kHz and 20kHz, rising to 1149 ohms at 20Hz, presumably due to the presence of output coupling capacitors. The unbalanced output behaved similarly, with a source impedance of 23 ohms at 1kHz and 20kHz but 447 ohms at 20Hz. The headphone jack offered an appropriately low output impedance of 5.3 ohms, this value consistent across the audioband.

All the subsequent tests were performed at the balanced outputs. The NSC 222's impulse response with 44.1kHz data (fig.1) was a minimum-phase type, with all the ringing following the single sample at 0dBFS. With 44.1kHz-sampled white noise (fig.2, red and magenta traces), the NSC 222's filter response reached full stop-band

1 See stereophile.com/content/measurements-maps-precision.

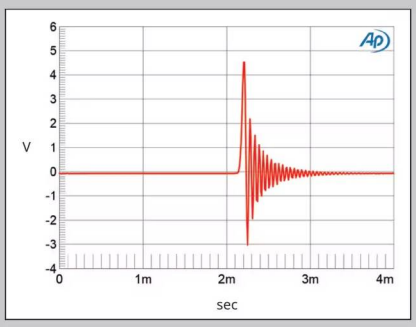

Fig.1 Naim NSC 222/NPX 300, digital inputs, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

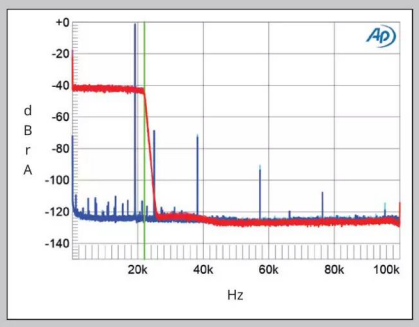

Fig.2 Naim NSC 222/NPX 300, digital inputs, wideband spectrum of white noise at –4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

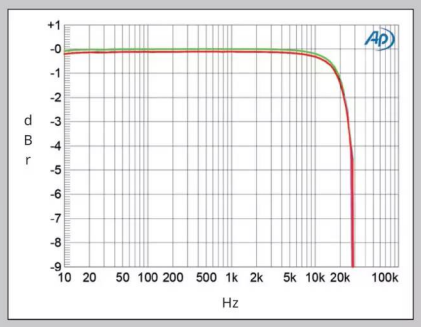

Fig.3 Naim NSC 222/NPX 300, digital inputs, frequency response at –12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel green, right gray), 96kHz (left cyan, right magenta), and 192kHz (left blue, right red) (1dB/vertical div.).

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section with its Naim logo, now backlit in white instead of green. To the right of that is the display window, with large numerals for setting the volume, readable from yards away; it can also display album art when digital music is playing.

On the far right is a vertical line of four multifunction push buttons, to power up or to select an input or operating mode; these functions are duplicated on the supplied remote control. Repeated button presses, either on the remote or those front-panel buttons, allow access to further inputs and modes including vinyl playback. This layered menu design can take a little getting used to; I needed a day or so's practice to operate it with reasonable facility.

The black-acrylic remote control essentially replicates the 222's front panel controls. It is a good size, operates well, and is radio-linked to avoid line-of-sight issues. Display brightness is user-controllable.

The Naim app, for Android or iPad, can be downloaded easily from the web to the user's chosen control device. App features include UPnP library browsing, with album art support, search, and playback controls. In addition to all the digital controls, the app lets you set the 222's input—if, for example, you wanted to play a vinyl record. Other app features include multiroom support (including "party mode"), grouped volume control, discovery of Naim streaming products on the network, and USB/iPod browsing with on-screen volume and playback control. System automation helps synchronize volume control and input selection on compatible Naim Audio devices. I used the app to play music from files stored on a local hard drive and in my Qobuz account, both via Roon—via a separate Roon server, of course.

The back panel of the NSC 222 is densely populated. On the far left is a fused IEC connector—13A European style in my case, since I'm based in the UK. Next to that is the RJ45 (network) connector, then a second USB Type-A connector for attaching external storage. Then come two "remote" sockets for system (On/Off) synchronization followed by a port for service/diagnostics. Several S/PDIF digital inputs occupy the row below, on BNC, RCA, and dual TosLinks. Farther right are the analog inputs: dual, gold-plated

measurements, continued

suppression at 26kHz. An aliased image at 25kHz of a full-scale tone at 19.1kHz (blue and cyan traces) can be seen at –70dB, and the distortion harmonics of the 19.1kHz tone are all low in level, with the second harmonic the highest in level at –73dB (0.02%). The Naim's frequency response with data sampled at 44.1kHz, 96kHz, and 192kHz is shown in fig.3. The response with 192kHz data (blue and red traces) doesn't extend any higher in frequency than with data sampled at 96kHz (cyan and magenta traces), the responses at both rates reaching –6dB at 29kHz.

Channel separation was excellent, at >95dB below 1kHz in both directions, falling to 73dB at 20kHz. The reduction at the top of the audioband is presumably the result of capacitive coupling between the channels. Even with the volume control set to its maximum, the balanced low-frequency noisefloor with the NPX 300 power supply (fig.4) was very low in level, and supply-related spuriae were absent. Spuriae at 60Hz and its odd-order harmonics made an appearance with the NSC 222 powered by its own internal supply (fig.5). These will be due to magnetic interference from the power transformer, but they are still very low in level, at or below –115dB ref. 0dBFS.

Increasing the bit depth from 16 to 24 with a dithered 1kHz tone at –90dBFS lowered the noisefloor by 12dB (fig.6), meaning that the NSC 222 offers around 18 bits' of resolution. With undithered data representing a tone at exactly –90.31dBFS (not shown), the three DC voltage levels described by the data were well resolved, and the waveform was noisy but symmetrical. With undithered 24-bit data, the result was a somewhat noisy sinewave (also not shown).

At low frequencies (fig.7), the second harmonic was the highest in level, at –86dB (0.005%). The second-order intermodulation product at 1kHz with an equal mix of 19 and 20kHz tones with a peak level of –3dBFS lay at a very low –96dB (0.0015%, fig.8). The higher-order products at 18kHz and 21kHz were even lower in level and, as expected from fig.2, the aliased images of the primary tones can be seen in this graph, albeit at low levels.

The Naim's rejection of word-clock jitter with 16-bit J-Test data was superb. Even with optical S/PDIF data, all the odd-order

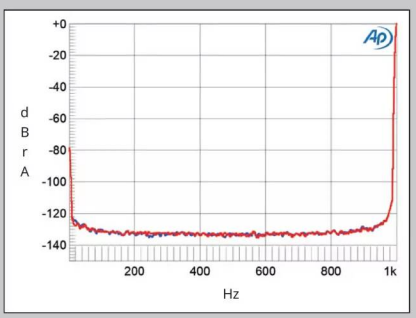

Fig.4 Naim NSC 222/NPX 300, digital inputs, spectrum of 1kHz sinewave, DC–1kHz, at 0dBFS with volume control set to the maximum (left channel blue, right red; linear frequency scale).

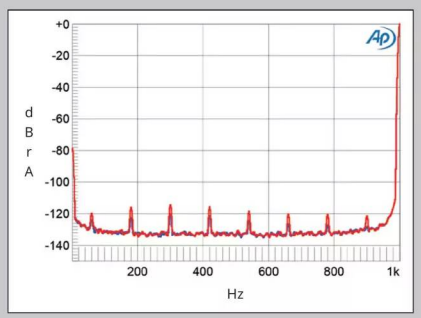

Fig.5 Naim NSC 222 with internal power supply, digital inputs, spectrum of 1kHz sinewave, DC–1kHz, at 0dBFS with volume control set to the maximum (left channel blue, right red; linear frequency scale).

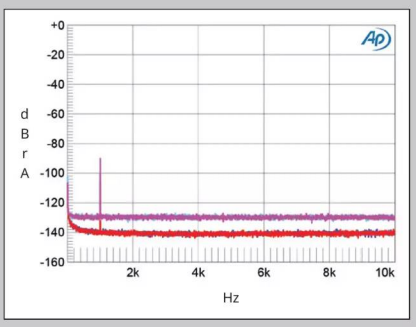

Fig.6 Naim NSC 222/NPX 300, digital inputs, spectrum with noise and spuriae of dithered 1kHz tone at –90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).

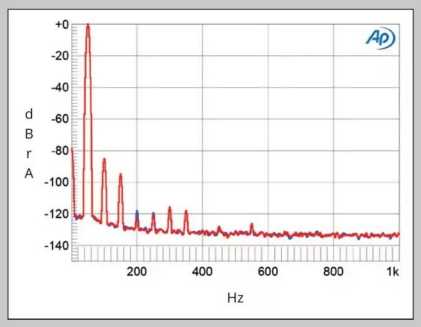

Fig.7 Naim NSC 222/NPX 300, digital inputs, spectrum of 50Hz sinewave, DC–1kHz, at 0dBFS into 600 ohms (left channel blue, right red; linear frequency scale).

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RCA plus ground, supporting the moving magnet phono section, and a single pair of line-level analog inputs on RCA. There is also an 8-pin DIN socket, which can be used as an analog input from supported (Naim) devices; Naim recommends this input for highest sound quality. This connection can also supply power for compatible external phono stages such as the one found in the Naim Solstice turntable. Below the analog inputs are umbilical connectors for connecting up to two external power supplies, including the NPX 300. When no external supply is connected, these connectors must be terminated with the included plugs. Whether or not an NPX 300 is employed, the analog and digital sections of the 222 are galvanically separated.

Far right is the analog output section, with RCA and XLR connectors, the latter pseudo-balanced. By default, only the XLR outputs are active; Naim recommends XLR for connection to the NAP 250 amplifier. There is also a chassis grounding switch, allowing the user to decide which audio-system ground is primary. In some setups, the effect of this switch is mild, but it can make a significant contribution to that subtle sense of musical communication possible with high-quality replay. Power supply artefacts in the noisefloor may be reduced to a minimum when this option is appropriately invoked.

The headphone output is by no means an afterthought. It incorporates a custom, downsized, discrete-circuit Naim power amplifier, which can deliver up to 1.5Wpc into 16 ohms via the usual $^1/_4$" (6.35mm) stereo socket; that's enough power to drive a pair of high-sensitivity loudspeakers, ample for any headphone I'm aware of.

In terms of digital playback, the NSC 222 is versatile, supporting USB-connected sources (via front and back sockets), optical and coaxial S/PDIF, and of course network streaming via a designated local network, or linked wirelessly via Wi-Fi. NSC 222 facilities feature Google Cast, Airplay 2, Bluetooth aptX, Spotify Connect,

measurements, continued

harmonics of the LSB-level, low-frequency squarewave lay at the correct levels, indicated by the sloping green line in fig.9. Repeating this test with Roon data gave an identical result.

Turning to the single-ended analog line inputs, I looked at the behavior via the RCA jacks, as I don't have a suitable DIN connector. With the Naim's volume control set to its maximum, the voltage gain at 1kHz measured 8.15dB from the balanced and single-ended outputs and 15.6dB from the headphone output. All the outputs preserved absolute polarity. The line input impedance is specified as a high 47k ohms; I measured 53k ohms at 20Hz and 1kHz, 40.7k ohms at 20kHz.

As anticipated from the digital input measurements, the line input's frequency response rolled off above the audioband (fig.10), reaching –0.75dB at 25kHz, –3dB at 41kHz, and –6dB at 60kHz. The blue and red traces in this graph were taken into the high 100k ohms load; the increase in output impedance at low frequencies meant that the response into 600 ohms (green and gray traces) rolled off below 200Hz, reaching –3dB at 60Hz and –6dB at 32Hz. As Naim's NAP 250 power amplifier, which Martin Colloms reviewed in the November issue, offers an input impedance of 47k ohms at low frequencies, there will not be any issues with that pairing. Fig.10 was taken with the volume control set to its maximum, "100." Both the frequency response and the excellent channel matching were preserved at lower settings of the control and from the single-ended and headphone outputs. The volume control operated in approximate 0.4dB steps at settings of "80" and higher, 1dB steps at "60" and lower.

The line input's channel separation was excellent, at >100dB below 1kHz and still 73dB at 20kHz. With the NSC 222 powered by the NPX 300, the line inputs shorted to ground, and the volume control set to the maximum, the wideband, unweighted signal/noise ratio (ref. 1V, which is the NAP 250 amplifier's sensitivity for full power) measured 77.3dB in the left channel, 79.5dB in the right channel. Restricting the measurement bandwidth to 22kHz increased the ratios to an excellent 92dB and an A-weighting filter increased them further, to 95dB. Spectral analysis of the Naim's low-frequency noisefloor with it powered by the NPX 300 revealed that with the volume control set to its maxi-

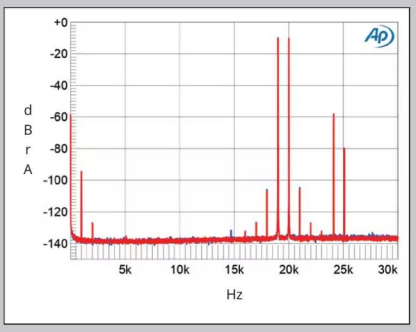

Fig.8 Naim NSC 222/NPX 300, digital inputs, HF intermodulation spectrum, DC–30kHz, 19+20kHz at –3dBFS peak, sampled at 44.1kHz (left channel blue, right red; linear frequency scale).

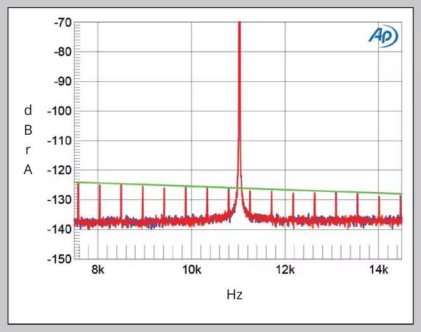

Fig.9 Naim NSC 222/NPX 300, digital input, high-resolution jitter spectrum of analog output signal, 11.025kHz at –6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz: 16-bit TosLink data (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

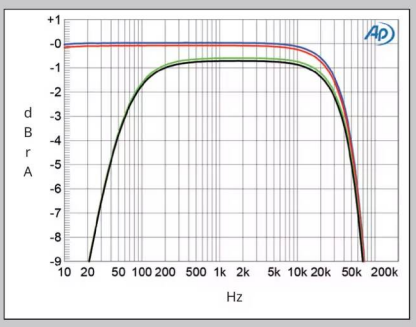

Fig.10 Naim NSC 222/NPX 300, line input, frequency response at 1V into 100k ohms (left channel blue, right red) and 600 ohms (left green, right gray) (1dB/vertical div.).

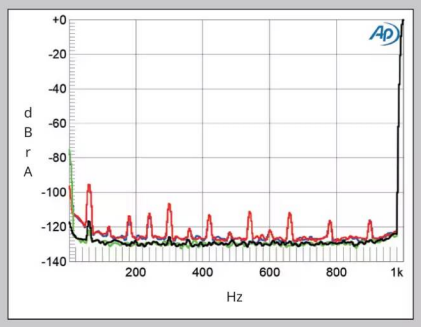

Fig.11 Naim NSC 222/NPX 300, line input, spectrum of 1kHz sinewave, DC–1kHz, at 1V into 100k ohms with volume control set to the maximum (left channel blue, right red) and to –20dB (left green, right gray) (linear frequency scale).

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Tidal Connect, and not least, Qobuz. Digital audio format processing handles WAV, MP3, and FLAC, with sample rates as needed up to 384kHz/32 bit, and DSD to DSD128; see the specifications for a complete list of supported formats. (MQA is absent, but these files will play in nonenhanced mode.) My Roon Core Nucleus also supplied much material from my extensive music files, supplemented by live streaming from Qobuz.

As an example of Naim's well-thought-out design, the NSC 222 supports four power modes: standby, network standby, network standby with extra power, and fully on. Network standby allows the 222 to be turned on with the Naim app. Network standby with extra power keeps the 222 fully powered up but with the display and logo turned off.

Technology

Some designers pursue the very latest DAC technologies and DAC-chip implementations, chasing after more bits and higher oversampling rates as if these alone would guarantee a performance margin over nominally lesser implementations. Naim has chosen a well-established DAC, the PCM1791A. As implemented, this Burr-Brown chip operates in its optimal external digital filter mode; a powerful SHARC DSP computes the many filter and shaping functions aiming to maximize sound quality, including high-order integer oversampling followed by prefiltering at 705.6kHz or 768kHz, according to the required sample rate. Asynchronous sources such as S/PDIF are buffered in a generous memory and reclocked to minimize the jitter that may arise from the digital transport and the S/PDIF interface.

The analog output from the DAC chip is low-pass filtered by discrete-transistor, class-A, active filters employing a topology designed for the task and employing custom-made, low-loss polystyrene capacitors. This type of capacitor is used for all relevant filtering duties, here and elsewhere in the 200 series. Naim says these capacitors are the most transparent. To reduce microphony, these vibration-sensitive components have precrimped lead-out wires and are mounted vertically. These capacitors are also thermally sensitive and require hand soldering.

After the low-pass filter is a line stage buffer, a powerful discrete transistor circuit designed to drive long cables, active filters for loudspeaker systems, or multiple power amplifiers as may be

measurements, continued

mum (fig.11, blue and red traces), some low-level power supply–related spuriae were present. Other than the spurious tone at 60Hz, these disappeared with the control set to –20dB, the input level increased by the same amount (green and gray traces). These spuriae were present at slightly higher levels with the NSC 222 powered by its internal supply, but the highest in level, at 60Hz, still lay below –90dB ref. 1V.

Fig.12 shows how the THD+noise percentage in the balanced output changed as the output voltage into 100k ohms increased. The downward slope below 4V output is due to actual distortion lying below the noisefloor. The distortion starts to rise above that output level but is still very low, before actually clipping at a high 8V. The unbalanced and headphone outputs clipped at the same voltage into 100k ohms. The balanced clipping voltage into the punishing 600 ohms load was only slightly lower, at 7.3V!

Examined at 3V output, to make sure the THD+N reading was not dominated by random noise, the distortion into 100k ohms (fig.13, blue and red traces) was extremely low over most of the audioband, rising slightly in the top octave. Distortion was only slightly higher into 600 ohms (green and gray traces) but rose in the bass, presumably related to the rise in output impedance in this region. The distortion signature appears to be entirely second-harmonic (fig.14) and extremely low in level, at –106dB ref.1V into 100k ohms (0.0005%). Intermodulation distortion was vanishingly low, even into 600 ohms (fig.15).

To examine the performance of the Naim's MM-compatible phono input, I left the switch on the rear panel in the Default position and connected a wire from the Audio Precision's ground terminal to the grounding lug on the Naim's rear panel. This input preserved absolute polarity at all three output types. The input impedance measured 41k ohms at 20Hz and 1kHz, and 28.4k ohms at 20kHz. The maximum gain at 1kHz was an appropriate 49.2dB at the balanced and unbalanced outputs, 56.6dB at the headphone outputs. The phono input's RIAA correction (fig.16) was superbly accurate, with excel-

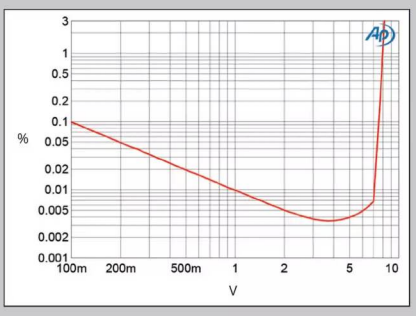

Fig.12 Naim NSC 222/NPX 300, line input, THD+N (%) vs balanced 1kHz output voltage into 100k ohms.

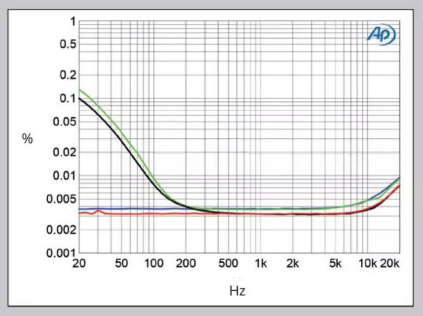

Fig.13 Naim NSC 222/NPX 300, line input, THD+N (%) vs frequency at 3V into 100k ohms (left channel blue, right red) and 600 ohms (left green, right gray).

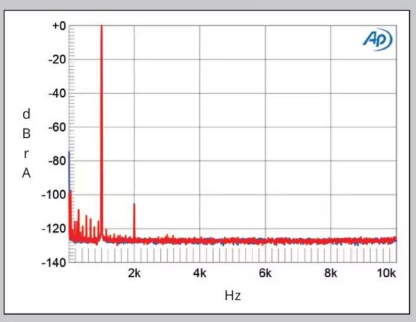

Fig.14 Naim NSC 222/NPX 300, line input, spectrum of 1kHz sinewave, DC–1kHz, at 1V into 100k ohms (left channel blue, right red; linear frequency scale).

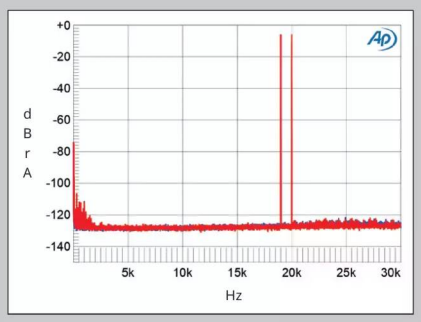

Fig.15 Naim NSC 222/NPX 300, line input, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 1V peak into 100k ohms (left channel blue, right red; linear frequency scale).

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Naim specifies nominal figures for frequency response and distortion. RIAA equalization is at a tight tolerance of ±0.1dB out to 20kHz, with a touch of rumble filtering—a sensible –3dB at 10Hz. The –3dB range is 3Hz–40kHz for analog signals. For digital, the –3dB upper limit is a mite lower, at 27kHz, to help filter unwanted ultrasonic processing noise, which could otherwise impair the fidelity of the NSC 222 output stage and the power amplifier that follows by initiating low-level intermodulation distortion.

The Naim NPX 300 auxiliary power supply

As previously mentioned, the NSC 222's performance may be upgraded by adding the NPX 300 power supply, built in matching casework. When this external supply is installed, the internal power supply is disengaged, silencing the internal mains transformer, lowering the noise and vibration floor. Once all those attending my listening sessions had become familiar with what was possible from the baseline, unadorned NSC 222, we unlocked the blanking plugs from the power supply input terminals and connected the hawser-like umbilical cables leading to the NPX 300 external power supply. Powered up again, we left for a tea break to allow the 222 to settle in. Though not previously connected up, the NPX 300 had already been running in for a couple of weeks at this stage.

Setup

We set up the complete system as a connected, synchronized unit. Thus the NSC 222 was powered by the NPX 300 supply upgrade, the NAP 250 was installed and the Naim rack was leveled and locked. The supplied Powerline Lite mains cables were connected, with 6m NAC A5 speaker cables and the included Naim interconnects. These components had all been used previously in demo systems; still, a couple of weeks of use as a background music source served to clear the cobwebs. My highly specified Linn LP12 was engaged with the installation of a high-output Hana MH moving coil cartridge.

To expedite the appraisal of the NSC 222 (self-powered and in combination with a single NPX 300, in a full-system audition combined with the previously reviewed NAP 250), we employed

measurements, continued

lent channel matching. The lows rolled off slightly, reaching –2.3dB at 10Hz, and, like the line input, the highs rolled off above the audioband.

The phono input's channel separation was excellent, at >80dB in both directions below 1kHz and still 72dB at 20kHz. The wideband, unweighted S/N ratio ref. 1kHz at 5mV, assessed with the NPX 300 power supply, the inputs shorted to ground, and with the volume control set to the maximum, was a good 75dB in both channels. Restricting the measurement bandwidth to the audioband increased this ratio by 2dB, while inserting an A-weighting filter resulted in a ratio of 80.9dB. These ratios were all 6dB less with the preamplifier powered by its internal supply, but this is still a relatively low level of noise. With the external power supply, the phono input's noisefloor almost entirely comprised random noise, even with the volume control set to the maximum (fig.17). Odd-order supply-related spuriae are present with the preamplifier's internal supply (fig.18), but these all lie at or below –73dB ref. 1kHz at 5mV and will be lower in level at lower volume control settings.

The phono input's overload margins, ref. 1kHz at 5mV, were excellent, at 23dB at 20Hz and 1kHz and 25dB at 20kHz. The second was the highest-level harmonic in the phono input's distortion signature (fig.19), but at –96dB (0.0015%) is inconsequential. The levels of the intermodulation products with an equal mix of 19 and 20kHz tones were just as low.

Naim's NSC 222 offers generally excellent measured performance via its digital inputs and its line and phono analog inputs. The rolloff above 20kHz in the frequency response is unusual but will not have audible consequences, and some earlier Naim amplification products behaved similarly.[2] The only measurable difference I found when I replaced the external NPX 300 power supply with the preamplifier's internal power supply was the appearance of spuriae at 60Hz and its odd-order harmonics, which will be due to magnetic interference from the transformer, but these are still low in level.—**John Atkinson**

2 See, for example, stereophile.com/content/naim-nait-integrated-amplifier-1989-measurements and stereophile.com/content/naim-uniti-cd-playerreceiver-measurements.

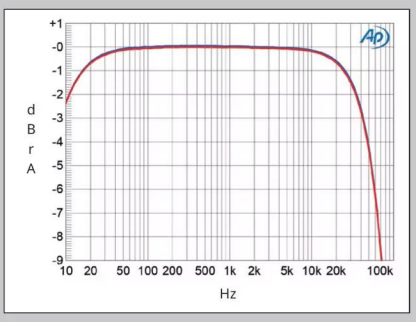

Fig.16 Naim NSC 222/NPX 300, phono input, response with RIAA correction (left channel blue, right red) (1dB/vertical div.).

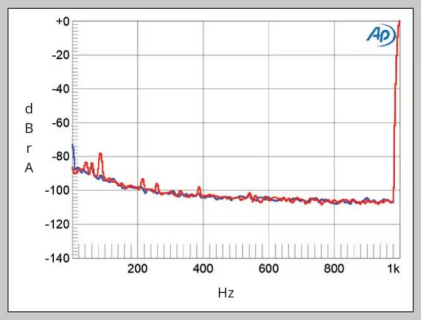

Fig.17 Naim NSC 222/NPX 300, phono input, spectrum of 1kHz sinewave, DC–1kHz, for 10mV input with volume control set to the maximum (left channel blue, right red, linear frequency scale).

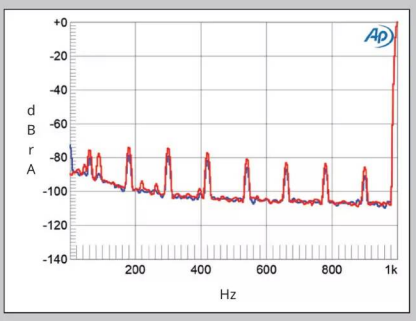

Fig.18 Naim NSC 222 with internal power supply, phono input, spectrum of 1kHz sinewave, DC–1kHz, for 10mV input with volume control set to the maximum (left channel blue, right red, linear frequency scale).

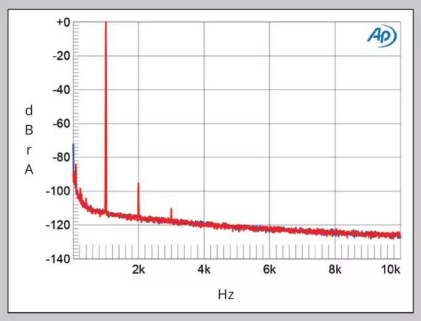

Fig.19 Naim NSC 222/NPX 300, phono input, spectrum of 1kHz sinewave, DC–1kHz, for 10mV input with volume control set to the maximum (left channel blue, right red, linear frequency scale).

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a five-level Naim FRAIM rack. I consider the FRAIM rack to be a no brainer for a three- or four-unit Naim setup such as this. And if you had the opportunity to assess the build quality and hear the contribution to the sound from the custom-engineered cable arrays made by Naim for these designs, you would be likely to choose those, too. The choice of cables, supports, and other setup options will contribute to the ultimate sound quality achieved.

The supplied electronics were laid out on the rack in a sequence that helped to maximize sound quality. At the top was the NSC 222 streamer-preamp, with a gap below. Then came the NAP 250 stereo power amplifier, another gap, and finally the NPX 300 power supply. The whole system was supported on the fully spiked and leveled platform/base Naim FRAIM, where all components are supported by plate-glass shelves on three stainless steel ball bearings, so it cannot rock or go out of alignment. In my experience, this sophisticated structure significantly contributes to sound quality; it follows that your results will partly depend on the use of a proper system support, though I have frequently operated the NAP 250 power amplifier on conventional supports with good results.

After much careful listening, by me and also my listening panel—Chris Bryant, Tony Faulkner, and Jon Honeyball—we removed the NPX 300 power supply, listened some more, reattached it, then listened again while recording our assessments.

Sound quality

We found that the Hana MH moving coil cartridge drove the NSC 222 phono input very well, with an even, neutral sound quality suited to a wide range of recordings. Surface noise was low, and there was no audible input hiss or hum. Stereo images were deep and well-focused; clarity was to a high standard.

For interest's sake, we also tried my Lyra Delos moving coil, specified at 6.3 ohms internal resistance and a low 0.6mV output (at 5cm/s, zero to peak). There wasn't a trace of powerline hum with the 222 ground switch set to float. At a high loudness setting, only a trace of "shhsh" input noise could be heard, and only if I closely approached the loudspeakers, stylus lifted; nothing could be heard from the listening seat.

With the higher-output Hana cartridge, phono input noise was very low, at pristine, direct-cut-disc levels. Vinyl sound was judged by the listening panel to be very neutral yet true to the character of each of these two fine cartridges, providing deep and wide stereo imaging and a stable focus. Replay was characteristically upbeat and rocked well—for example, dealing with complex rhythms such as those found on "Spirits in the Material World," from *Ghost in the Machine* by the Police (LP, A&M Records AMLK 63730). This track divides the soporific from the rhythmically awake, and the Naim combo kept a fine grip on the proceedings. "Tom's Diner," by Suzanne Vega—the familiar a cappella version[2]—was a delight, with key musical values firmly in place, including the characteristic bouncy phrasing; I found it impossible to turn off. I had forgotten how good this record is. The Delos combination held sway, with better incisiveness. Still with the Delos, "Summer," from that old Decca stalwart *Le Quattro Stagioni* with Alan Loveday and the Academy of St. Martin in the Fields (Argo ZRG 654), conducted by Neville Marriner, was a dreamy delight, with classically voiced string timbres and fine stereo delivered with satisfying ambience and image depth. An original copy of Dave Brubeck's *Take Five* (CBS 31769) came up fresh and upbeat, with foot-tapping rhythm.

Files streamed to the 222 over my network via Roon impressed. Pat Metheny's "Cathedral in a Suitcase" from *Secret Story* (CD rip, Geffen GED 24468) sounded bold and fresh, with strong dynamic contrasts and those heart-stopping moments of deep and structured bass—just what you'd wish for from a well-configured Naim system. While it will play loud, with fine bass power and extension, the ultimate reward of a system like this has more to do with the command of a coherent rhythmic line and a natural expressiveness that frequently takes the listener closer to live performances. The S/PDIF input of this track, delivered from a CD transport, proved only fractionally better than the streamed version, a difference easily forgotten in a few moments. That these two sources were so close confirms the top-quality performance of the NSC 222's hard-wired streaming input.

Guthrie Govan's *Erotic Cakes* (16/44.1 FLAC, JTC Records, Qobuz)

2 This song has an interesting—you might say notorious—hi-fi history. The *a cappella* version—the song appears twice on the album *Solitude Standing* (A&M SUZLP 2), once *a cappella*, once instrumental—was used by researcher Karlheinz Brandenburg as a reference in developing his MP3 compression scheme; upon hearing it, Brandenburg realized that Vega's solo voice would ruthlessly expose compression artifacts. Incidentally, Tom's Diner, which occupies the northeast corner of Broadway and 112th, is the establishment shown on *Seinfeld* before each diner scene; it is said that Vega frequented the place when she was a student at Barnard College, just a few blocks north. Tom's is also just down the street from my apartment. The food is bad, but they make good milkshakes.—**Jim Austin**

had a tortuous recorded history. In an effort to capture the impressive live sound, guitars and drums were recorded several times unsuccessfully; finally, recording engineer Paul Cornford chose to rerecord the guitars in a wood-paneled room using characterful, tube-powered stage loudspeakers. Perhaps against the odds, this album sounded surprisingly well-constructed through the Naim combo. Bass guitar lines were gripping, and the tuneful drums sounded tight and punchy, nicely matching the virtuoso performances. Digital reverb could not have achieved the live-room quality Cornford finally captured.

Digital format comparisons

Supplied by a colleague on a memory stick and loaded to the Roon storage were some format variations for familiar works including Bob Dylan's "Man in the Long Black Coat" from the 1989 album *Oh Mercy*. This densely layered if highly produced track can lose its way musically on inferior systems. Here, the NSC 222 showed high resolving power, revealing quite subtle differences between 16/44.1, 24/96, and 24/176.4 WAV files—and finally DSD64. The DSD was probably my favorite, revealing a marked degree of crisp precision and musical communication. Here, the soundstage fairly glowed with atmosphere and ambience. The 16/44.1 version really did sound worse, though not by a big margin.

From another planet entirely: Lady Gaga with Bradley Cooper, on "Out of Time," from the soundtrack to the 2018 *A Star Is Born* remake, was reproduced with great foot-tapping rhythmic involvement and captivating atmosphere. In the event this track sounded most musical at 24/48—better than the higher-resolution options, though I did not have access to the full provenance of these several files.

Much of my NSC 222 listening was plain CD rips streamed with Roon. I turned to a classic, "My Compensation" from Laurie Anderson's *Life on a String* (Nonesuch 79539-2). I enjoyed the crisply focused spatiality and crystal-clear sound combined with strong timing and that special sense of encompassing envelopment that this track can impart. Powerful, expressive, and spatially resolved bass was also a key component—well in evidence here.

"The Creek," from the album *Visible World* by Jan Garbarek (CD rip, ECM 1585), was auditioned first via the 222 streamer-pre and then from the mighty, reference-grade Naim ND 555/555 PS DR combo, here delivered to the analog input of the NSC 222 preamp. The latter sound was not found wanting, as it conveyed much of the reference quality of this outboard three-box streamer. But was it worth doing? I think not; the sound quality of the hard-wired inboard DAC is already at a high-enough level, and any improvement via the more expensive source component is partly offset by the need to connect with an external cable. The hard-wired, inboard DAC implementation offered a clear, vivacious, open sound, with infectious drive, and it got better over several weeks of use.

"The Survivor," also from *Visible World*, demonstrated dramatic, seemingly uncompressed transients, supported by that characteristic deep, powerful bass line.

Another favorite during these auditions was Tony Faulkner's recording of Michael Tippett's tone poem *The Rose Lake*, with Colin Davis—specifically the 10th movement, one of several movements denoted "Fast." Here, we enjoyed a crystal-clear and spacious soundstage with natural timbres and very fine focus. Tony, who was in attendance, was quite impressed with this digital transcription from his original analog recording, as reproduced via this Naim system. Roon assigns a dynamics rating of 19 points to this album, which is very high. And it's obvious when you hear it.

Headphone output

I used the classic moving coil, cone diaphragm, reference-grade Denon AH-D7200 and, from HiFiMan, the HE400S, to assess the NSC 222's headphone output. The Denon could be played very loud indeed, needing only a few tens of milliwatts, but there was also more than enough power for the planar-magnetic HiFiMan: I moved the volume control up a gear, and realistic sound levels were obtained from a silent background. This NSC 222's headphone port was nicely expressive—open, but neutral, allowing the particular qualities of these two fine transducer technologies to be clearly expressed. Transparency, dynamics, focus, and detail were seriously good, confirming the claim that this was a custom-designed miniature power amplifier and not a chip-based afterthought.

With NPX 300 power supply

After listening for a long time as a system with the NPX 300 power supply, we removed it, listened, then put it back. And then we assessed the difference.

Undeniably, this power upgrade works. We liked what we'd heard without the upgrade, but with it was obviously better, in almost all aspects of sound quality, including the headphone output. You need to hear it for yourself to fully comprehend the effect, but my team was obviously keen on the gains, surprised at the sound quality upshift, and demanding replay of many of the tracks

previously heard to reinforce their appreciation of this augmented configuration. Further backtracking, to operating the 222 on the internal supply, confirmed this was no mistake nor overreaction.

If I had to put a figure on it, the uplift was some 20% of the extant system quality. The streaming sound quality of the NSC 222 had moved unmistakably closer to that of my ND 555 dual-supply reference DAC, while all the facilities benefited, both the LP disc input/equalizer and the headphone output.

We also noted an underlying, small improvement over the 2 1/2 months or so allocated for this evaluation. Past experience with Naim gear suggests that this behaviour is likely to continue over several months, if more gradually.

A conspicuous success, this auxiliary power supply offers comprehensive sound quality improvement for the existing installation and comfortably earns its keep. Firmly recommended.

Conclusions

I was happy to leave this stack installed until the job was completed and felt no urgency to swap it out. The promised improvement from the optional NPX 300 power supply was convincingly delivered. We tried cable upgrades, and the inherent quality was high enough to clearly hear the advantage of Naim's Super Lumina, though this cable series comes at a high price.

All operational modes, analog disc, digital audio streaming and decoding, plus headphone and loudspeaker drive were consistent, distinguished by an innate sense of energy, imbued with transparency and microdetail. There was also a significantly open, wideband character, somewhat different from the mildly "contained" sense of some previous Naim iterations. And it is that satisfying, involving rhythmic quality that continues to entertain. I did not fully anticipate this system's ability to throw such deep and wide stereo images, now of reference class. Time and again, it offered insights which had only been heard on rather more costly combinations of audio components. When appropriate, the ambient field sparkled with delicate spatial detail, excellently focused within satisfyingly deep imaging. This speaks of high resolution and great transparency, which I admit to valuing highly.

In conclusion, I reckon it constitutes a fine measure of true audiophile quality in a well-priced, versatile modern package, handsomely exceeding the sum of its parts. ■

ASSOCIATED EQUIPMENT

Analog source Linn LP12 player with Keel chassis, Karousel main bearing, Radikal motor control, Naim ARO tonearms, and Lyra Delos and Hana MH cartridges.
Digital source Naim UnitiCore network server and S/PDIF source, Roon Nucleus + server control with Qobuz, etc.; Linn Klimax DSM streamer-DAC, Naim ND555 Streamer-DAC with two 555 PS(DR).
Preamplification Townshend Allegri Reference control unit, Naim SuperLine-SuperCap DR phono preamp.
Power amplifier Naim NAP 250DR, D'Agostino Progression 350 power amplifiers. Loudspeakers Magico A5, FinkTeam KIM, BBC LS3/5a (15 ohm).
Cables Interconnects: Naim standard and Super Lumina; Transparent MM2 and XL MM2; Van den Hul Carbon TFU. Speaker: Transparent XL and NAC A5. Power: Naim Powerline Lite and Powerline.
Accessories 4- and 5-tier Naim FRAIM racks.—**Martin Colloms**

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Jack Vad. Grammy Winning Engineer

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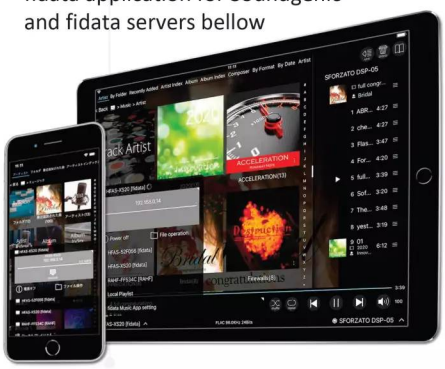

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ROB SCHRYER

Leak Stereo 230

STREAMING INTEGRATED AMPLIFIER

Sometimes I think expensive components—I'll let you decide what constitutes expensive—should come with a big red sticker on the box that reads "WARNING! This product will probably not meet your expectations!" That's because when you spend a lot of money on something, you expect that something to have no flaws and to sound nigh perfect. Why else would you have paid so much? As you gaze at it, touch it, and listen to it, it constantly reassures you that you made the right decision by picking it over all the other, less pricey candidates. It has to be unambiguously better than any component of its nature that has passed through your system, or else, what was the point in all that upgrading?

That's a lot of expectations for a product to live up to, but then our hobby is all about expectations. How many expectations spring to mind when you think about solid state, tubes, digital, class-D, moving coil, LP, CD, streaming, MQA, MDF, power supplies, AC power, capacitors, shorting plugs, fuses, bass, cost, your listening room? Is your head spinning yet? If not—and possibly if so—you're an audio enthusiast! You thrive on conjecture, guesstimates, instinct, uncertainty, personal bias, vague science, and, above all, hope for a big sonic payoff. It's who you are, and it's why regular people can't be audio hobbyists. It would drive them mad.

Prior to this review, I had expectations about the product under review, the Leak Stereo 230 ($1695 with the walnut enclosure), based on, among other factors, price. Those expectations seemed justified when I first saw the Stereo 230's compact shipping carton. I assumed it would weigh much less than it did—28lb it turns out, heavy enough to cause my outstretched arms to buckle under its weight when the UPS guy handed it to me. When that happened, my first thought was, "I hope he didn't notice," followed by, "Is the Stereo 230's power supply that substantial?"

The Leak Stereo 230

Yes, it is. But first, some background.

Leak was on the front lines of the audio revolution that begat hi-fi as we know it. Harold Joseph Leak founded the company in England in 1934, two years after the electric guitar was invented, two years before the BBC began broadcasting, and five years after the start of the Great Depression.

Throughout the '40s and into the '60s, Leak manufactured amplifiers, loudspeakers, cartridges, turntables, and—perhaps

SPECIFICATIONS

Description Solid state, Roon Tested, class-AB, stereo streaming integrated amplifier with DAC, JFET–based moving magnet/high-output moving coil phono preamp, dedicated headphone amplifier, tone controls, and remote control. DAC section employs ESS Technology's ES9038Q2M chip. Analog inputs: 2 pair RCA line-level, 1 phono. Digital inputs: HDMI ARC, USB-B, S/PDIF on RCA, TosLink, aptX HD Bluetooth. Analog outputs: 1 RCA pre-out, 1 ¼" (6.35mm) headphone, speaker binding posts. Digital outputs: 1 optical, 1 S/PDIF on RCA. Hi-rez support via USB input: PCM 32/768; DSD512; full MQA decoding; Hi-rez support via S/PDIF inputs: PCM 24/192, full MQA decoding. Power output: 75Wpc RMS into 8 ohms (18.75dBW), 115Wpc RMS into 4 ohms (17.6dBW).

Dimensions With wood enclosure: 13" (328mm) W × 5.8" (147mm) H × 16.3" (414mm) D; Without wood enclosure: 11.8" (300mm) W × 4.5" (115mm) H × 16.3" (414mm) D. Weight: 28lb (12.7kg).

Serial number of unit reviewed LH000805CED1053 auditioned, LH000805CFD1195 measured. Manufactured in China.

Price $1695 with enclosure, $1495 without. Approximate number of US and Canadian dealers: 27. Warranty: 3 years.

Manufacturer
Leak Audio, IAG House, 13/14 Glebe Rd., Huntingdon, Cambridgeshire, PE29 7DL, UK.
Web: leak-hifi.co.uk.
US importer: MoFi Distribution, 1811 W. Bryn Mawr Ave., Chicago, IL 60660.
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Measured performance agrees with our ears: the Legacy Focus XD loudspeaker system delivers linearity from below 15 Hz up to (and beyond) 20,000 Hz. This measured performance is nothing short of state of the art and is a testament to well thought out engineering. The Focus XD are taking the position of my ultimate reference speaker system."
C. Chase & C. Lo Raso, Secrets of Home Theater & High Fidelity

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more ubiquitously in North America—tuners, especially the Trough-line tuner released in 1955. Among Leak's other offerings were significant design "firsts": the first tube amplifier to lower harmonic distortion to 0.1%; the first speaker to implement true-piston cone technology. Production continued until 1979, when Leak succumbed to the pressures of international mass-market competition.

China-based IAG Group—owner of Luxman and a bevy of well-known English brands—revived the company by reinstating its design facilities in the UK. In 2020, the year that would've been Mr. Leak's 113th birthday, Leak's first new products in 40 years, the CDT transport and the Stereo 130 amplifier, were released. The 130 is a rejuvenated Stereo 30 from 1963, said to be the first commercially available solid state amplifier. The Stereo 30 put out 15Wpc. Jimi Hendrix owned one.

Launched two years after the 130, the subject of this review looks like the 130's twin, but it comes with higher aspirations. Per Leak's press release, the Stereo 230 is "the evolution of the acclaimed Stereo 130, offering more versatility, much more power, and improved sonics."

In an email, I asked Jamie O'Callaghan, global sales and marketing director for the IAG Group, how the 230 was fundamentally different from the 30. He responded, "We now have 50 years of technology, innovation, and learning to enhance the offering.

"One key difference," he wrote, "was the development of transistors over the last 50 years. The modern transistors are designed to offer higher efficiency. This alone represents a major improvement over the original 30.

"Another important change from the Stereo 30, and from the Stereo 130, is the 230's use of an intelligent 'double parallel' design in its power stage. It not only increases power output compared to the other models but allows for easier handling of difficult loads and low-impedance speakers.

"We also designed a precision DC Servo Circuit to control and stabilise the power amplifier's DC voltage, resulting in improved output quality, especially in the bass, and a clean and warm sound, characteristic of Leak."

What about that arm-buckling weight? "The power supply is heavy!" Jamie said. "Its transformer weighs 2.9kg"—that's 6.4lbs—"and was made exclusively for the 230. We do not use off-the-shelf products. It's a staple of our class-AB design—the transformer is key to it all. But, naturally, a lot of the 230's weight can also be attributed to its chassis and [optional] casing. It's a real wood veneer and a real wood casing, similar to the Wharfedale Linton's cabinet." Wharfedale is also an IAG brand, along with Quad, Mission, and a couple of others.

The 230 combines old-world features—a phono stage, headphone jack, and tone controls—bunked alongside new-world ones that were half a century into the future when the model first came out. These include hi-rez streaming up to 32/768 PCM, native DSD512, and full MQA decoding. Digital processing is handled by a 32-bit ES9038Q2M Sabre Reference DAC chip using proprietary circuitry said to make the most of ESS Technology's Hyperstream II architecture and Time Domain Jitter Eliminator to eliminate noise and improve high dynamic range. The 230 is also "Roon Tested," meaning that Roon verified that the product works with Roon's management software but, in contrast to Roon Ready products, does not use Roon's RAAT streaming protocol.

The Stereo 230 is also equipped with aptX HD Bluetooth and HDMI ARC connectivity (for use with a television). Its amplification stage is a MOSFET-based class-AB design said to deliver 75Wpc into 8 ohms or 115Wpc into 4 ohms. (We'll see what JA's measure-

MEASUREMENTS

I measured a different sample of the Leak Stereo 230, serial number LH000805CFD1195, than the one RS had auditioned. I performed the measurements using my Audio Precision SYS2722 system.[1] I preconditioned the Stereo 230 by following the CEA's recommendation of running it at one-eighth the specified power into 8 ohms for 30 minutes. At the end of that time, the black grille on the amplifier's top panel was hot, at 118.1°F/47.9°C.

Looking first at the amplifier's behavior with its single-ended analog line input, with the Leak's volume control set to its maximum the voltage gain at 1kHz into 8 ohms measured 32.7dB from the speaker terminals, 0.6dB from the preamplifier output, and 10.37dB from the headphone output. The line input preserved absolute polarity (ie, was noninverting) from both output types, and the input impedance was slightly lower than the specified 10k ohms, at 8.23k ohms across the audioband.

The preamplifier output impedance was a low 90 ohms from 20Hz to 20kHz; that at the headphone output was a very low 5 ohms, again at all audio frequencies. The loudspeaker output impedance was low at 20Hz and 1kHz, at 0.11 ohm, but rose to 0.14 ohm at 20kHz. (These values include the series resistance of 6' of spaced-pair speaker cable.) Consequently the variation in frequency response with our standard simulated loudspeaker[2] (fig.1, gray trace) was minimal. The small-signal response into resistive loads (fig.1, blue, red, cyan, magenta, and green traces) didn't start to roll off until well above the audioband.

Fig.1 was taken with the volume control set to its maximum; a 0.5dB difference, in favor of the left channel, appeared at lower settings of the control. The Stereo 230's reproduction of a 10kHz squarewave into 8 ohms (fig.2) featured short risetimes and no overshoot or ringing. The bass and treble controls offered boosts and cuts of

1 See stereophile.com/content/measurements-maps-precision.

2 See stereophile.com/content/real-life-measurements-page-2.

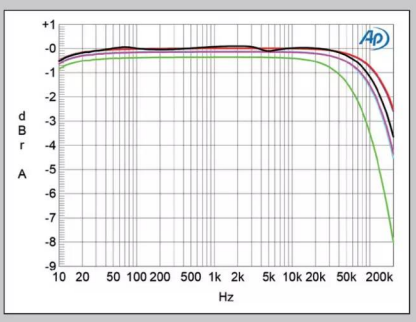

Fig.1 Leak Stereo 230, line input, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), 2 ohms (green) (1dB/vertical div.).

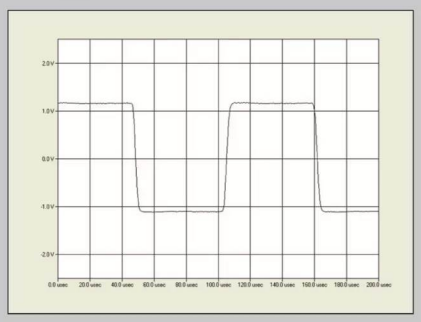

Fig.2 Leak Stereo 230, line input, small-signal, 10kHz squarewave into 8 ohms.

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ments say.)

Why not class-D, which is popular now, even in retro products like this? "Class-D offers many virtues, but it's just not Leak," Jamie said. "The Stereo 230's baby sister, the Stereo 130, was several years in development with a very stringent design goal of making sure that the ethos and soul of the Leak brand weren't lost in pursuit of building a modern amplifier. The 230 comes a good four years after Leak was revived within our engineers' labs. It's a genuine innovation for the company in terms of design, compatibility, and power supply, and it's still a 'Leak'. We don't believe that would have been possible to do in a class-D design."

Among the control knobs on the 230's faceplate is a direct-mode push-button, which bypasses the tone controls. I found the input selector smartly constructed. Active inputs are flanked by a dotted light that confirms input selection and blinks when the volume is raised or lowered via the nicely finished, slablike remote control.

Encased in the optional walnut enclosure, I found the 230 attractive in a timeless way.

Listening

The Stereo 230 arrived brand-new. If I was expecting the unbroken-in Leak to deliver a flat, harmonically meager sound compared to that of my $15,000 class-A Shinai integrated—well, that's not what I heard. What initially knocked me back in my seat in a moment of unexpected incredulity was the depth and integrity of the soundfield. It was architecturally molded.

Granted, I was playing an audiophile CD—*Contact* (Fidelio FACD 001) by Art Johnson and Frédéric Alarie, an analog recording of double bass and an electric guitar, captured by gear bearing the names Ampex, Tascam, Nirvana, and Transparent. It's meant to sound intimate, pure, resolved, natural. Fresh out of the box, the Leak brought that sound out. I had only wanted a taste of the Leak before putting it through its break-in paces—with zero intention

measurements, continued

up to ±10dB (fig.3).

Channel separation below 2kHz was good, at >80dB in both directions, but decreased to 63dB at 20kHz due to the usual capacitive coupling between the channels. In Direct mode, with the Stereo 230's line inputs shorted to ground and the volume control set to the maximum, the wideband, unweighted signal/noise ratio (ref. 2.83V into 8 ohms) measured a good 77.2dB in both channels. Restricting the measurement bandwidth to 22kHz increased the ratio to 88.4dB, and an A-weighting filter increased it further, to 91dB. With the tone controls active but set to do nothing, these ratios were all 6dB worse. Spectral analysis of the Leak's low-frequency noisefloor in Direct mode with the volume control set to the maximum (fig.4, blue and red traces) revealed that AC power-line–related spuriae were present, albeit at low levels. Reducing the volume by 20dB and increasing the input level by the same 20dB reduced the levels of the odd-order supply harmonics (green, gray traces). The random noise was 6dB higher with the tone controls active but dropped by 10dB with the volume control set to –20dB.

With both channels driven, the Stereo 230 is specified as delivering maximum output powers of 75Wpc into both 8 ohms (18.75dBW) and 115W into 4 ohms (17.6dBW). With our usual definition of clipping as being when the THD+N reaches 1%, the Stereo 230 slightly exceeded the specified powers, clipping at 80Wpc into

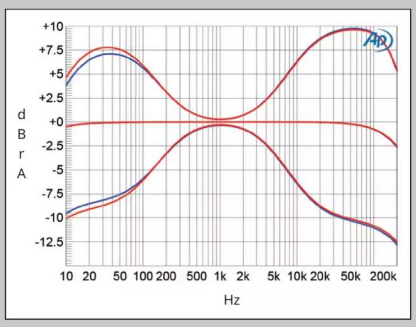

Fig.3 Leak Stereo 230, line input, frequency response at 2.83V into 8 ohms with treble and bass controls set to their maximum and minimum (left channel blue, right red).

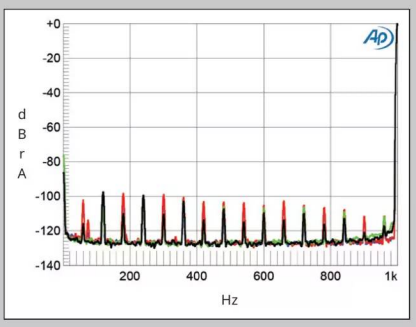

Fig.4 Leak Stereo 230, line input, Direct mode, spectrum of 1kHz sinewave, DC–1kHz, at 1W into 8 ohms with volume control set to the maximum (left channel blue, right red) and to –20dB (left green, right gray) (linear frequency scale).

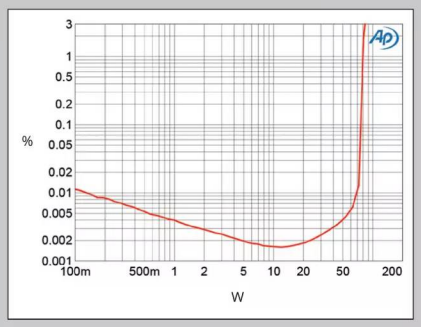

Fig.5 Leak Stereo 230, line input, THD+N (%) vs 1kHz continuous output power into 8 ohms.

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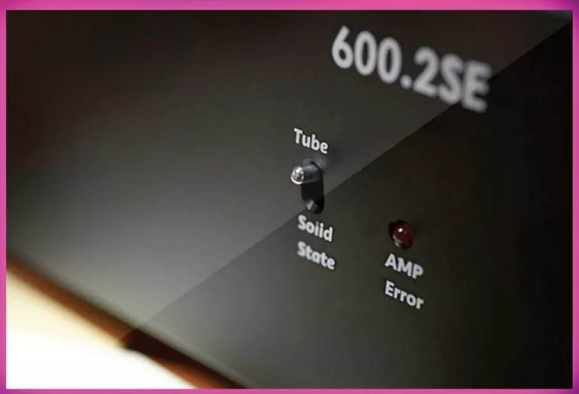

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of judging it—but judge it I did, because what I heard caught me unexpected.

As soon as the album's first track kicked in—Stevie Wonder's "You Are the Sunshine of My Life"—I was peering down a room transposed into my own: the recording studio. It stretched quite a bit beyond my own room, about 25' deep, judging by the acoustic reflections delineating its shape. Alary's double bass sounded well-proportioned and hearty in tone and low-end weight. To borrow the title of an album by The Who, the low notes and their rhythm were meaty, beaty, big, and bouncy. And that guitar! String tones sounded realistic, not just in big-scale character but in how their smallest shifts revealed varying states of string tension. The curlicues at the end of notes were appropriately twangy, steely-resonant, and spatially carved-out.

Listening to *Contact*, even in these early hours, brought to the fore how fluid and coherent the Leak's sound was. There was nothing hard or choppy. Its tonal balance tended more toward sweet than warm. I heard no frequency-response bumps, just an overriding naturalness of timbre and a bloomlike roundness to the notes.

But what spoke louder than any word I might find to describe the Leak's sonic attributes was the about-face of my intentions for the day. What I expected to be a 3-minute casual audition turned out to be two serious, 30-minute auditions the day I turned it on for the first time, sessions that ended up being written about in this review. I was expecting sound from an unbroken-in, $1695 solid state amp to grate. Another expectation bites the dust.

Three days of continuous break-in later, I settled in for official business. I dropped the laser on Tord Gustavsen's "At Home," from his 2007 album *Being There* (CD, ECM B0008757-02), and was greeted by a carousel of piano tones endowed with just the right amount of string-felt jangle, sultry efflorescence, soft-colored hues, and finely measured force. Decays seemed elongated. Again, as with *Contact*, I heard a mellifluous musical delivery, an evenness to the presentation coupled with a rhythmic pace that was poised and self-assured. When the drums and double bass joined the piano, the picture was big and wide, with life-sized instruments living inside. But most of all, it sounded utterly cohesive. The soundfield was a unified, meticulously sealed whole.

The Leak's overriding character was one of musical buoyancy disposed of light and color, with an effortless liftoff of notes. It was uplifting psychologically. The effect was mood-altering. At $1695, it's good for a few therapy sessions.

Once in a blue moon, something happens in my listening room that feels like a full-circle event of rare occurrence, like a solar

measurements, continued

8 ohms (19dBW, fig.5) and 120Wpc into 4 ohms (17.8dBW, fig.6). The distortion levels at 12.67V, which is equivalent to 20W into 8 ohms and 40W into 4 ohms (fig.7), were very low. Although the THD rose in the top two audio octaves, it remained below 0.1% (–60dB).

The distortion signature appears to be primarily second-harmonic in nature (fig.8), lying at just –97dB (0.0014%, fig.9). Intermodulation distortion was also low (fig.10), the difference product at 1kHz lying at –71dB (0.03%) and the higher-order products at 18kHz and 21kHz at –80dB (0.01%).

Turning to the Stereo 230's MM-compatible phono input, I connected a wire between the ground terminal on the amplifier's rear panel and the analyzer's chassis ground, which minimized noise. This input preserved absolute polarity at all of the Leak's outputs. The input impedance, specified as 47k ohms, was 45k ohms at 20Hz and 1kHz, and 39.2k ohms at 20kHz. The maximum gain at 1kHz was 74dB at the speaker outputs, meaning that 1kHz at 5mV results in a signal just below the clipping power. The maximum gain at the preamplifier output was 41.8dB and 51.8dB at the headphone output. To avoid clipping the power amplifier stage, I used the headphone output for the phono input testing, which mutes the speaker outputs.

The phono input's RIAA correction (fig.11) was accurate and well matched between the channels. The wideband, un-

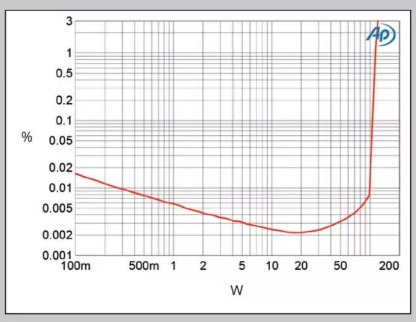

Fig.6 Leak Stereo 230, line input, THD+N (%) vs 1kHz continuous output power into 4 ohms.

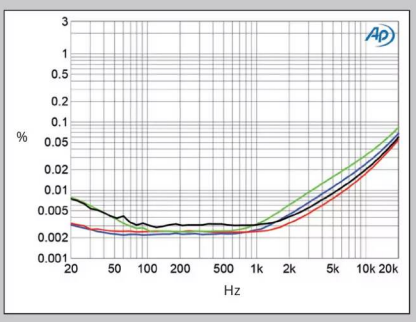

Fig.7 Leak Stereo 230, THD+N (%) vs frequency at 12.67V into: 8 ohms (left channel blue, right red), and 4 ohms (left green, right gray).

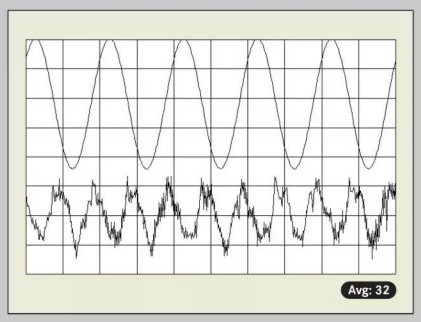

Fig.8 Leak Stereo 230, line input, 1kHz waveform at 20W into 8 ohms, 0.0026% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

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eclipse but indoors. It's when, following some change to my system, the soundstage suddenly appears so locked in, so unaffected by my oddly shaped room and its furnishings, it's as if it had been pushed out of the speakers and given a life of its own, one existing on a plane of self-sufficient ease. This holographic, out-of-(room-and-speaker)-body effect happened with the Leak in my system.

That same sense of soundstage integrity was evident on Patricia Barber's live recording *Companion* (CD, Blue Note 5229632). Even the flurry of echoes originating from the instruments seemed unusually connected, moving across the ceiling in interlaced patterns that shifted and swirled like a flock of starlings. On this CD, Barber's sibilants can sound hot, but the Leak did a good job of reducing their sizzle by increasing their textural density.

Across its tracks, *Companion* sounded full-bodied, full-scale, and viscerally alive. Michael Arnopol's bass notes were burly and agile. I liked how the Leak brought his notes into relief. At times, it felt as if I was watching the bass-note equivalent of a paddleball ball bopping straight at my face. The Leak emphasized the bass's string elasticity, plucked force, tonal weight variations, and the volume of energy striking the microphone's diaphragm.

Something else that stood out was how wide the Leak would sometimes depict the distance between two sources of sound. It happened during the double-bass solo that opens the album's second track, "Use Me," when an audience member starts clapping during a quiet passage two-thirds in, sustained by the trail end of a note. Gauging by its tunneling echo, that clap appeared much farther away from the stage than I remembered it. Despite the distance, the sound was continuous; there was no gap between the clap and the stage, no missing space or sonic suckout. Sound floated from one end to the other along a harmonically saturated path.

Barber's keyboard work was laid bare, her finger action on-the-key specific, revealing the notes being pushed into existence and flowing into each other like spreading ink.

Separation and imaging of instruments was very good. Contours were softly etched but well-defined. The soundstage was expansive, almost billowy in its airiness and scale, while instruments popped out from Chicago's Green Mill stage with the kinetic energy of a live event. I had the impression of hearing all the notes on the recording—of hearing a lot of them as plain as day—drawing my attention to the structure of the melodies.

On the third track, "Like JT," the Leak couldn't summon the seismic weight of the piano's lower registers, but it emanated enough of their dark-toned, sonorous warble to sound authentic. And when the claps at the end of songs erupted, they sounded realistic, distinct, and plentiful, flashing like fat raindrops splattering on a moonlit street—dozens of fat raindrops.

At a certain point, as I was listening to *Companion*, I thought: "I can hear the simplicity of the design." It sounded direct. Unobstructed. Lucid. I asked Jamie whether he could explain what might be at the source of this purity I was hearing. "This is a tricky one to elaborate on in isolation," he replied. "But the design is as per the original Leak philosophy: There's no need to complicate matters in the pursuit of quality hi-fi. So, outside the EQ, the signal path is as close to 'direct' as possible."

He continued: "We kept the preamp simple to maintain signal purity and away from noise as much as possible—a simple theory with effective results."

The next CD I played was *DownBeat* magazine's 1984 pick for Jazz Album of the Year, *The Ballad of the Fallen*, a collaboration among Charlie Haden, the newly departed, lamented Carla Bley,

measurements, continued

weighted S/N ratio with the inputs shorted to ground and the volume control set to its maximum was a good 68dB ref. 1kHz at 5mV in both channels. Restricting the measurement bandwidth to the audioband increased this ratio to 71dB, while inserting an A-weighting filter gave a further improvement to 83.4dB. The phono input's noisefloor was commendably free from power supply–related spuriae.

The phono input's overload margins, measured with the volume control set to 2 o'clock to avoid clipping the headphone output, were good, at 21dB ref. 1kHz at 5mV from 20Hz to 20kHz. Harmonic distortion via this input was very low; with an input 10dB below the overload point, the second harmonic was the highest in level at just –90dB (0.003%). The levels of the intermodulation products with an equal mix of 19 and 20kHz tones were vanishingly low (fig.12).

To examine the performance of the Leak's digital inputs, I used the Audio Precision's optical S/PDIF output, as well as sending test signals to the amplifier via USB from my MacBook Pro. The Stereo 230's S/PDIF input locked to datastreams with sample rates up to 192kHz. Apple's USB Prober app identified the Leak as "LEAK USB Audio 2.0" and revealed that the USB port operated in the optimal isochronous asynchronous mode. Apple's AudioMIDI utility showed that the Stereo 230 accepted 24- and 32-bit integer data sampled at all rates from 44.1kHz to 768kHz via USB.

With the volume control set to its maximum, a 1kHz digital signal at –20dBFS

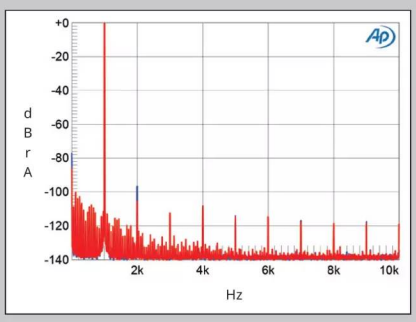

Fig.9 Leak Stereo 230, line input, spectrum of 1kHz sinewave, DC–10kHz, at 20Wpc into 8 ohms (left channel blue, right red; linear frequency scale).

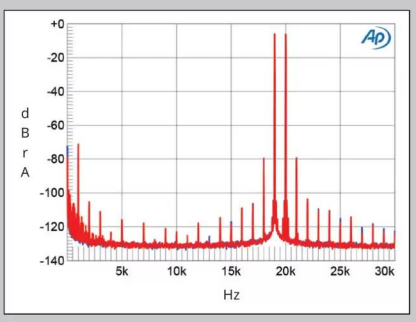

Fig.10 Leak Stereo 230, line input, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 40Wpc peak into 4 ohms (left channel blue, right red; linear frequency scale).

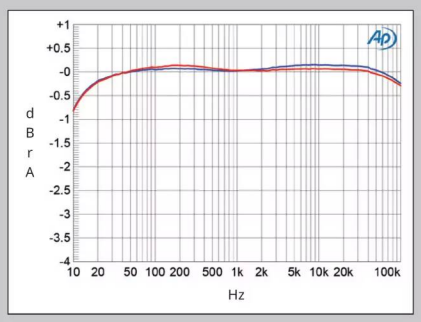

Fig.11 Leak Stereo 230, phono input, response with RIAA correction (left channel blue, right red) (0.5dB/vertical div.).

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saxophonist Dewey Redman, trumpeter Don Cherry, and Haden's Liberation Music Orchestra. The album opens with the Catalan national anthem: "Els Segadors," a stately, Latin-flavored multibrass motif. It's beautiful, but this CD isn't one of ECM's best-sounding ones. It's a bit flat and clinical in an early-digital way. On many a system I've heard them on, the louder brass parts can turn into a shredded steel mass that has desiccated the real thing of all life. Not this time. The brassy bursts were reproduced with a quivering, burnished tone with metallic bite and glistening texture, but they stayed earthbound and composed. Transparency was very good: I could easily distinguish the various brass lines being played simultaneously, along with their respective air expulsions and echo trails. The track ends with a solo by Haden. It was captivating—the finger-sweeps across the fingerboard, the perfectly-in-tune finger landings, the clear-toned vibratos, the protracted pitches.

Segueing into the titular second track, what was once a soaring anthem was now a tango-powered parade. The music was festive, vivid, and palpable—it even made my room palpable, turning it into an animated zone festooned with glinting colors and harmonic flourishes. It confirmed what I'd suspected: that the Leak had a knack for making up-tempo music sound like an event, something happening in the moment, fresh and feral. The Leak blew the air of life into this early CD recording, a sweetness-tinged breeze that elevated notes and allowed the music to sound more fleshed out and limber.

I played another track with double bass, one I like to use to see how well a system can resolve different instruments crammed into a murky central image: Medeski Martin & Wood's "Chubb Sub," from the compilation album *Last Chance to Dance Trance (perhaps): Best of (1991-1996)* (CD, Gramavision GCD 79520). The song plows forward on a rollercoaster rail of a rambunctious, fat-bodied bass riff that threatens to overwhelm the rest of the music but instead holds back just enough to let the other instruments shine through. The Leak nailed that dynamic, delivering Chris Wood's onrushing bass lines with the right mix of bulging attitude and tempered restraint to allow Billy Martin and John Medeski to show off their drumming and keyboard chops, respectively, in open view.

The title track offered a transparent spread of percolating tones and detail: the hollowed-out consistency of the individual shaker beads at the beginning of the track, the finger flutters on the bass strings, the gurgling rumbles of the organ chords, the clanging punctuations of the piano notes, all of it timbrally graphic.

Curious, I disengaged the direct-mode button to activate the equalizer's tone controls, for bass, balance, and treble. I moved the bass knob a quarter-turn to the left and replayed "Chubb Sub." This resulted in a slight loss of touch and purity compared to before, and a shift in tonal balance across the frequency range. I returned the bass knob to "neutral" and did the same with the treble button, with similar results.

Reengaging the direct-mode button underscored how tonally natural and of-a-piece the Leak sounded without the EQ in the signal path.

Those qualities extended to the unit's dedicated JFET-based MM/high-output MC phono stage, via which my stereo version of *Thelonious Monk With John Coltrane* (LP, Craft Recordings CR00611) served up tonally rich, first-row views of skilled musicianship and a good sense of space and depth between instruments on the more center-filled cuts. On the more spacious, stereo-panned ones, the sound was luminous and dynamic, with in-room extension that nearly enveloped the sweet spot.

On Alice Coltrane's *Journey in Satchidananda* (LP, Impulse! IMP-228), Coltrane's harp flickered with touch and texture while

measurements, continued

resulted in an output level of 9.81V into 8 ohms from the loudspeaker output, which is 8.2dB below the clipping voltage into this load. The Leak has 12dB too much gain for its digital inputs. The level at the preamp output with this signal was 240.7mV; that from the headphone output was 762.1mV. I used the headphone output for the digital input testing. With the volume control at its maximum, data at 0dBFS clipped the headphone output. I reduced the volume so that the level with 0dBFS data was 5V, well below clipping.

There is just one reconstruction filter; its impulse response with 44.1kHz data (fig.13) revealed that it is a short minimum-phase type, with a small amount of ringing following the single sample at 0dBFS. With 44.1kHz-sampled white noise (fig.14, red and magenta traces), the Stereo 230's digital input response rolled off gently above 20kHz, with the slow rolloff typical of the reconstruction filter used by MQA-enabled DACs for non-MQA data.[3] The aliased image at 25kHz of a 19.1kHz tone at –3dBFS (blue and cyan traces) was attenuated by just 20dB, though the distortion harmonics of the 19.1kHz tone are all very low in level, at or below –90dB (0.003%).

Increasing the bit depth from 16 to 24 with a dithered 1kHz tone at –90dBFS lowered the noisefloor by 18dB (fig.15), meaning that the Stereo 230's digital inputs offer

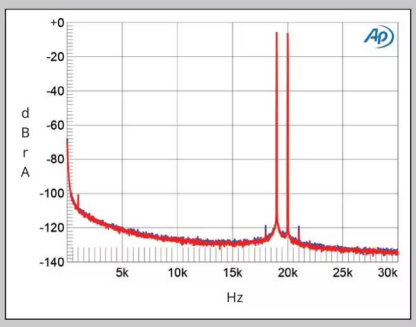

Fig.12 Leak Stereo 230, phono input, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 150mV peak input (left channel blue, right red; linear frequency scale).

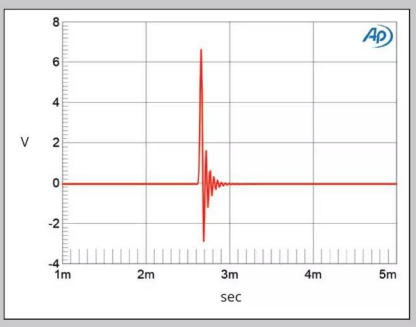

Fig.13 Leak Stereo 230, digital input, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

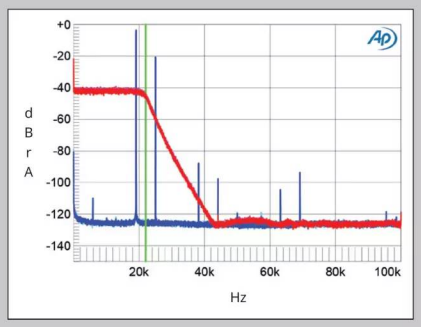

Fig.14 Leak Stereo 230, digital input, wideband spectrum of white noise at –4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

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Pharoah Sanders's angular saxophone phrasings sounded creamy and polished, illuminating the studio space around them. This album is bursting with sounds—from an oud, double bass, sax, harp, tamboura, bells, tambourines, often all of them at once. The Leak's phono stage presented the whole intelligibly, teeming with wriggling, swarming detail against a harmonically plush, layered backdrop. The phono stage, I concluded, would make a terrific standalone unit.

I'm going to end this "Listening" section with the cherry on the sundae, or maybe this part is the sundae and what came before was the cherry—that's how favorable my listening impressions were when I streamed native DSD64 files through the Leak from a laptop. I realize I'm late to the native-DSD party—this was my first time streaming native DSD—but boy was I missing out! For helping to make it happen, I'm grateful to erstwhile *Stereophile* scribe Tom Gibbs for his guidance and to Roon for being such a versatile music-management system when I was stumped by the instructions provided in Leak's "USB and DSD Setup Guide." It could have gone sideways, but the story had a happy ending.

The fun began with Thelonious Monk's *Straight, No Chaser* (DSD64 download). It sounded sublime—fuller, richer, meatier, with more sumptuous tones and natural warmth than I'd heard from the other formats through the Leak. Charlie Rouse's tenor sax sounded bold, butter smooth, expressive, and lap-dance intimate. I didn't hear digital; I heard an absence of it—a rich musical consistency devoid of an electronic undercurrent. Sounds from drums, double bass, and piano were vibrant, substantial, and overflowing with harmonics, with tone existing on another level of realism from what I normally hear from my front-end components.

I got similar results with Bill Evans's *You Must Believe in Spring* (DSD64 download). While not quite up there soundwise with *Straight, No Chaser*, this recording offered playback I could easily sink into, which instantaneously put my mind in a high state of musical receptiveness.

Native DSD through the Leak sounded like expensive audio—in the high-end category—and this was just with standard, lowest-grade DSD—DSD64, 2.8MHz—and not with one of the higher DSD sampling rates. It sounded better than when I compared it to DSD downconverted to 32/352.8 PCM, which was still very good but lacked the harmonic complexity, instrumental weight, and sense of musical ease of the native DSD files.

This may not sound sexy, but there's something to be said about streaming music from a laptop. I can only imagine what native DSD sounds like through a dedicated server, but I aim to find out. Isn't the audio journey grand?

Conclusions

Like the Cambridge EVO 150 I reviewed in 2021 and the plethora of midpriced marvels I've heard at audio shows, the 230 is an example of how far the sound quality and versatility of affordable audiophile gear has come in the last few years.

The class-AB Leak provided a sense of color, ease, purity, and expressiveness I don't normally associate with class-AB topology. Maybe with class-A? Maybe with tubes?

Any nitpicks? Bend my arm, and I might concede that the 230's highs might not have been as airy or extended as those from some of the more expensive gear I've heard, but the Leak brings so much to the table—quality sound, sturdy build quality, functional versatility, a 3-year warranty—that I feel a bit cheap nitpicking. I didn't hear a $1500 product; I heard a well-designed product regardless of price. The Stereo 230 exceeded my expectations. But you probably expected me to say that. ■

around 19 bits' worth of resolution. With undithered data representing a tone at exactly –90.31dBFS (not shown), the three DC voltage levels described by the data were well resolved and the waveform was perfectly symmetrical, though overlaid with high-frequency noise.

The second-order intermodulation product at 1kHz with an equal mix of 19 and 20kHz tones with a peak level of –3dBFS lay at a very low –103dB (0.0007%, fig.16). As expected from fig.14, the aliased products at 24.1kHz and 25.1kHz are relatively high in level.

The Leak's rejection of word-clock jitter with 16-bit data was identical with USB and S/PDIF data. While all the odd-order harmonics of the LSB-level, low-frequency squarewave were at the correct levels, indicated by the sloping green line in fig.17, the spectral spike that represents the high-level tone at one-quarter the sample rate is broadened at its base, this due to low-frequency random-noise jitter.

The Leak Stereo 230 amplifier offers excellent measured performance from all of its inputs.—**John Atkinson**

3 See, for example, fig.2 at stereophile.com/content/mytek-digital-brooklyn-bridge-ii-roon-core-preamplifier-measurements.

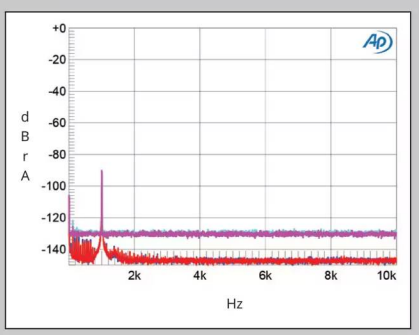

Fig.15 Leak Stereo 230, digital input, spectrum with noise and spuriae of dithered 1kHz tone at –90dBFS with: 16-bit data (left channel cyan, right magenta), 24-bit data (left blue, right red) (20dB/vertical div.).

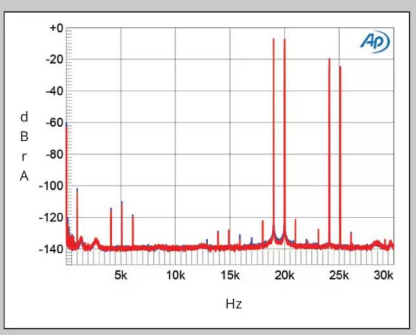

Fig.16 Leak Stereo 230, digital input, HF intermodulation spectrum, DC–30kHz, 19+20kHz at –3dBFS peak, sampled at 44.1kHz.

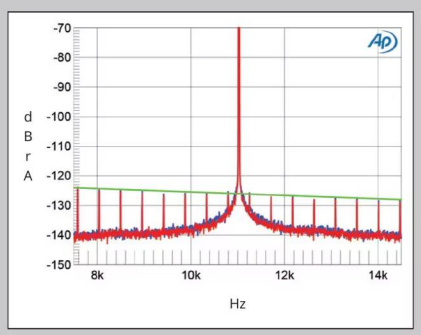

Fig.17 Leak Stereo 230, digital input, high-resolution jitter spectrum of analog output signal, 11.025kHz at –6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz: 16-bit TosLink data (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

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KALMAN RUBINSON

Merging+Hapi MkII

NETWORKED AUDIO CONVERTER

I've been running a 5.1 system for years. Recently, I expanded it to 5.3 with the addition of two more subwoofers. This system is manageable with one of my eight-channel DACs.

Even more recently, I dipped my toe into Dolby Atmos, which made it necessary to lash up at least four more channels.[1] That was a big problem, since neither JRiver nor Roon can support and sync more than one output device at a time, and the multichannel DACs I already owned tap out at eight channels.

I turned to the Arvus H2-4D Renderer, which offers 16 channels of digital output over AES3 and 16 channels of balanced-analog output. This worked, but piping everything through the Arvus meant forswearing DSP, including DiracLive. I really needed a DAC with at least 12 channels.

The Merging+Hapi has been around for years.[2] It's one of Merging Technology's professional audio converters, intended for studio monitoring, at recording sites and in mastering studios that employ Merging's Pyramix software, which supports DSD recording and playback up to DSD256. The MkII is the latest generation.

Via the Hapi, you can almost smell the cigarette smoke.

Merging Technology has first-class audio performance in its DNA. Its founder, Claude Cellier, formerly worked for famous Swiss audio maker Nagra Kudelski, where he played a key role in the design and development of the Nagra IV-S and T-Audio TC analog tape recorders. One need only scan the Hapi MkII's specifications (see below) to be impressed with their depth of detail and impressive performance of this unit.

In its base configuration, the Hapi MkII supports eight channels of input or output via AES3, ADAT, or stereo S/PDIF.[3] Expansion slots allow you to add up to two plugin cards, each of which can support eight channels of D/A, A/D, or two-way A/D/A.

1 See stereophile.com/content/arvus-h2-4d-multichannel-dolby-atmos-digital-processor.

2 The name Hapi was originally used by legendary audio designer Bill Hegeman for several versions of his preamp.

3 The base configuration would be adequate for users with eight or fewer channels and active, digital-input loudspeakers, such as the Kii Three, Dutch & Dutch 8C, KEF LS50 Wireless II or LS60 Wireless, or the recently reviewed JBL 4329P.

SPECIFICATIONS

Description Network-connected audio converter with two expansion slots for input/output boards. Base unit digital I/O: 8 AES3 I/O (DB-25), 8 ADAT/2 S/PDIF (TosLink), RAVENNA/AES67 (RJ45), Word Clock (BNC), Sync I/O (DB-15: LTC, MIDI, Video Reference). Base unit analog output: Two headphone (6.35mm, 3.5mm TRS). Voltage (AC): 90V–260V, 47–63Hz. Voltage (DC via optional supply): 10–14V. Max power consumption: <30W. Specifications via headphone-monitoring jacks: THD+N: <–106 dB (0.0005%) at 1kHz, 0dBFS. Dynamic range (A-weighted): 118dB. Frequency response: 6Hz–22kHz (+0/–0.2dB) at 48kHz; 2Hz–44.2Hz (+0/–0.3dB) at 96kHz; 2Hz–88.1Hz (+0/–0.3dB) at 192kHz. Max output level, high: 15.5dBu (600 ohm load); low: 7.3dBu (16 ohm load). Maximum output power: 200 mWpc (16 ohm load). Output impedance: 20 ohms. Supported sample rates: 44.1–384kHz PCM plus DSD64, 128, and 256.
DA8P option card Eight-channel D/A converter board based on the ESS ES9028PRO converter chip with balanced outputs via DB-25 (AES59/Tascam Analog pinout). Supports PCM up to 384kHz and DSD up to DSD256. Max line output @ 0dBFS, 24dBu setting: 25dBu +0/–0.5dB; 18dBu setting: 19dBu +0/–0.5dB. Frequency response, +0, –0.3dB, PCM, fs=48kHz: 0Hz–20kHz; DSD, fs=2.8224MHz: 0Hz–20kHz; fs=2.8224MHz: 0Hz–50kHz. Line output impedance (differential): 90 ohms. Dynamic range (20Hz–20kHz): 124.5dB flat, 127dB A-weighted. THD+N, 1kHz, 0dBFS: < –116dB (0.00016%). Crosstalk, 1kHz: –140dB; 20Hz–20kHz: < –115dB. Latency, slow rolloff: 9 samples; sharp rolloff: 35 samples.
Dimensions 19" (483mm) W × 1.73" (44mm) H × 12.6" (320mm) D. Weight: 10lb (4.5kg).
Finish Powder-coated steel and brushed aluminum.
Serial number of unit reviewed H95730 (base unit), DP8579, DP85795 (DA8Ps) auditioned; H95861 (base unit), DP85778 (DA8P) measured. Manufactured in Switzerland.
Price As tested (Hapi MKII + 2 DA8P): $8411.00. Warranty: Two years from the date of purchase, original purchaser only. Limited to defects in materials and workmanship.
Manufacturer
Merging Technologies S.A.,
Route du Verney 4, 1070
Puidoux, Switzerland.
Tel: +41 (0)21 946 04 44.
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The DA8P board provides eight channels of D/A conversion, with balanced analog output—so, two such boards support 16 channels of D/A conversion. It is capable of converting PCM up to 384kHz and DSD up to DSD256, with extremely low specified noise and distortion and wide dynamic range. A bonus is the high output voltage, useful in a system like mine where the DAC drives the amplifiers directly.

The Hapi MkII seemed to be the logical next step for me. Support for more than eight channels meant I could, when called upon, play back music in Dolby Atmos—though in these auditions, the music maxed out at eight channels. I was attracted to the idea that I would be using it to review other equipment with recordings that were recorded and mastered on the Hapi or its big brother, the Horus. As they used to say in the TV commercials, "I just had to have it!" So I bought it.

Don't worry be Hapi

As befits a serious professional device, the physical appearance of the Hapi MkII is severe, clean, and neat. On the front left are two blue-illuminated buttons shaped like nested pyramids. The larger button is the power switch; the smaller accesses the setup menu. On the extreme right are 6.35mm and 3.5mm (1/4" and 1/8") headphone jacks. Adjacent to these is a knob that serves as both a rotary control for navigating the menu settings and as volume control. To the left of the knob is an OLED used to display menu settings during setup and the volume levels of the various channels. It is all perfectly functional and strikingly similar to its sibling, the NADAC+8,[4] which, in contrast with the Hapi MkII, is intended for audiophile use. However, the Hapi MkII lacks the graciously styled chassis and superior control ballistics of the NADAC. The displays are similar, but the Hapi must squeeze bars representing 16 channels onto the same OLED screen that the NADAC uses for eight. The Hapi MkII also lacks a dedicated remote control. All those issues can be resolved by accessing the Hapi's webpage with a smartphone or tablet.

Except for the headphone jacks, all the connectors are on the back. At the far right is an AC power inlet and a jack for an auxiliary power supply, intended mainly for backup. At far left are two optical jacks for ADAT or S/PDIF input/output, two BNC connectors for Word Clock input/output, a DB-25 jack for AES3 input/output—eight channels of each—a DB15 connector for various sync functions, and a pair of RJ45 Ethernet connections. In between are the two expansion slots; on my Hapi, they are occupied by two DA8P boards, populated by more DB-25 connectors serving up 16 channels of analog output—eight on each board. The pinout of these is industry-standard AES59 (Tascam Analog). I used Mogami Gold DB-25-to-XLR snakes to connect these analog outputs to my power amplifiers.

The data source used with the Hapi MkII must be RAVENNA/

4 NADAC is short for network-attached DAC; see Jon Iverson's NADAC report at stereophile.com/content/merging-technologies-nadac-network-attached-dac and my take at stereophile.com/content/music-round-77.

MEASUREMENTS

KR was still working on his review at the time I was scheduled to measure the Merging Hapi MkII, so Independent Audio loaned me a different sample for the testing. This sample had the serial number H95861 and was running firmware version 1.5.1b55774. I followed the instructions in the quick-start guide to download and install both the Merging MTDiscovery app and the RAVENNA/AES67 Virtual Audio Device (VAD) driver on my MacBook Pro. After I connected the Hapi to my router, the app found and identified it and opened its local control webpage on my browser. This page allowed me to select the digital input—AES3 or S/PDIF—set the maximum output level, choose the reconstruction filter, adjust the volume (in accurate 0.5dB steps), and select other functions. All the functions can be operated with the front-panel push knob, but the webpage is easier to use.

I used my Audio Precision SYS2722 system[1] for the measurements, repeating some of the tests with the higher-resolution Audio Precision APx555. My Hapi sample was fitted with the optional DA8P D/A module; this had the serial number DP85778 (Run 14). The multichannel balanced analog output is implemented with a female, Tascam-standard DB-25 jack. I borrowed a two-channel DB-25–XLR adapter cable from KR for the testing. The Hapi's AES3 digital input is implemented with another DB-25 jack. As I didn't have a compatible adapter cable, I used the optical S/PDIF input for the testing, repeating some of the measurements with AES67 network data sourced from Adobe Audition running on my laptop. (There were no differences.)

I used the local webpage to set the Hapi to automatically accept the sample rate of the incoming data. (The rate can also be set manually.) All the testing was performed with the volume control set to its maximum and the maximum gain set to +18dBu. With those settings, a 1kHz digital signal at 0dBFS resulted in an output level of 6.55V. Setting the maximum gain to +24dBu increased the level by 6dB, as expected. The headphone output on the front panel has a fixed maximum level, this measuring 1.266V with a 1kHz tone at 0dBFS. The Hapi preserved absolute polarity, ie, was noninverting, from both the balanced and headphone outputs. The balanced output impedance is specified as a low 90 ohms; I measured 87 ohms from 20Hz to 20kHz. The headphone output impedance was 20 ohms at all audio

1 See stereophile.com/content/measurements-maps-precision.

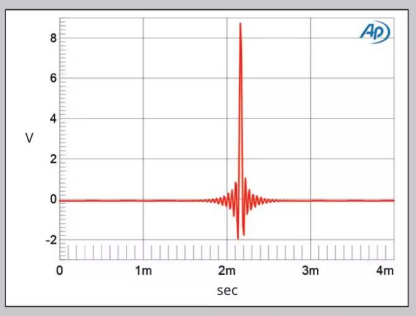

Fig.1 Merging Hapi MkII, Sharp filter, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

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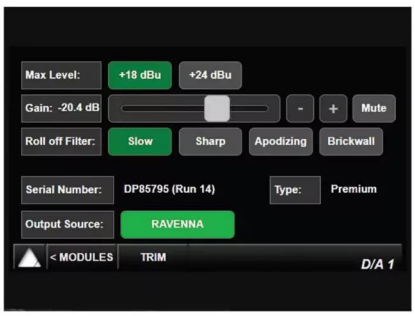
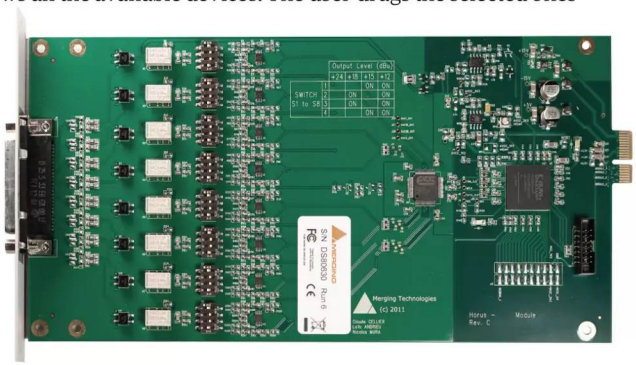
AES67-compatible.[5] In my system, this is achieved by running a MAD ASIO driver package supplied by Merging on my PC. The Arvus H2-4D Renderer mentioned above is another example of a RAVENNA-compatible data source. Any Dante[6] device is also compatible. Merging makes it RAVENNA-capable. The RAVENNA/AES67 Virtual Audio Device (VAD) serves the same function for Mac OS.





Data arrives at the Hapi by Ethernet. At first I plugged the Hapi to a local Ethernet switch, shared by my PC/server and LAN. This worked, but I experienced frequent signal interruptions and excessive buffering. Merging says that RAVENNA operations do not demand anything from the network beyond 1Gbps capability; they add, however, that RAVENNA hogs (my word, not theirs) bandwidth, so they recommend keeping it on a separate LAN, apart from other domestic or studio operations. I have a managed switch on order. Until it arrives, I will connect the Hapi directly to my PC's second Ethernet jack with a CAT6a cable, creating a private domain. This worked.

Physically connecting the Hapi and server to the LAN is one thing; making the *logical* connections is another. This task has become much easier since my previous Merging experiences, with the NADAC+8 and Anubis.[7] Partly this is because I have learned from those experiences, but most of the improvement is due to the fact that the Merging ASIO Device—"MAD" for short—is a greatly enhanced, more stable version of the earlier RAVENNA/AES67 ASIO Driver, and the Aneman tool, which allows the user to map specific channel connections among multiple RAVENNA devices, is more coherent, consistent, and better documented than before.

Still, the Hapi MkII is not "Plug-and-Play." The Aneman tool shows all the available devices. The user drags the selected ones into an active zone, shown in the upper left of Aneman's "Matrix View" (see image next page). The available inputs are stacked on the lower left, the available outputs are arrayed across the upper right, and the matrix of their intersections is at the lower right. The blue squares show the mapping of my PC server's source channels to the Hapi's output channels. The complete freedom to route the channels is especially useful for active multiamping of

5 A bit of pro-audio nomenclature: To interface with data sources, Hapi uses RAVENNA / AES67, an open-source audio-over-internet-protocol standard developed for the broadcast industry. RAVENNA is bidirectional and supports multicasting and proper synchronization: All devices on the network derive their own, locally generated media clocks from the network clock distributed with Precision Time Protocol (aka PTP).

6 Dante is another audio-over-IP technology that is widely used in the pro-audio world.

7 See stereophile.com/content/music-round-100-multichannel-merging-anubis-page-2.

measurements, continued

frequencies.

The Hapi offers a choice of four reconstruction filters: Slow, Sharp, Apodizing, and Brickwall. The Sharp filter's impulse response with 44.1kHz data (fig.1) indicates that this is a conventional linear-phase type, with time-symmetrical ringing on either side of the single sample at 0dBFS. The Brickwall and the Apodizing filters' impulse responses were identical to the Sharp filter's. The Slow filter's impulse response (fig.2) shows that this is a very short linear-phase filter, with minimal ringing.

With 44.1kHz-sampled white noise, the Hapi's response with the Apodizing filter rolled off sharply above 20kHz (fig.3, red and magenta traces), reaching full stop-band attenuation at 22.05kHz, half the same rate, as indicated by the vertical green line in this graph. The aliased image at 25kHz of a full-scale tone at 19.1kHz (blue and cyan traces) is suppressed by 100dB, and the highest-level distortion harmonic is the third, at –83dB (0.004%). The Brickwall filter (not shown) behaved identically, other than having a much lower level of the third harmonic. The Sharp filter's output (not shown) reached full stop-band attenuation at 24kHz. The Slow

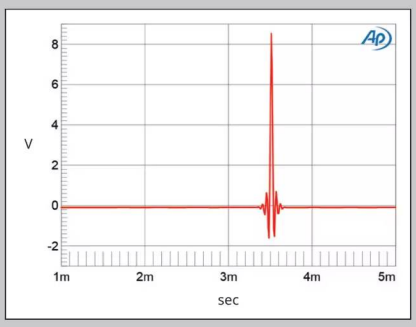


Fig.2 Merging Hapi MkII, Slow filter, impulse response (one sample at 0dBFS, 44.1kHz sampling, 4ms time window).

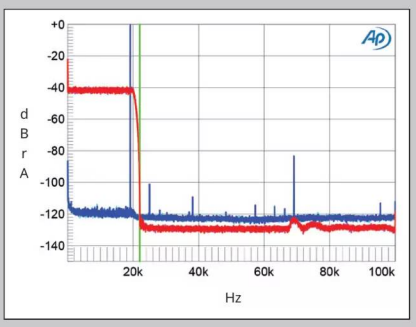


Fig.3 Merging Hapi MkII, Apodizing filter, wideband spectrum of white noise at –4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

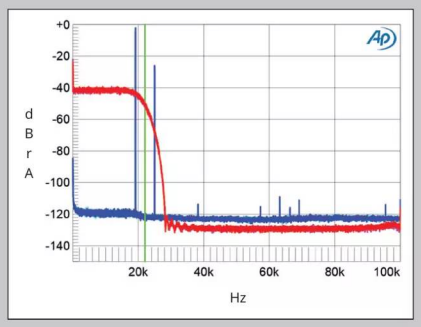


Fig.4 Merging Hapi MkII, Slow filter, wideband spectrum of white noise at –4dBFS (left channel red, right magenta) and 19.1kHz tone at 0dBFS (left blue, right cyan), with data sampled at 44.1kHz (20dB/vertical div.).

multiple multiway speakers or, as in my case, for the independent EQ of several subwoofers in a multichannel system. You can even route some channels to the AES3 or S/PDIF digital outputs rather than through the DAC, in case you're using active loudspeakers.

All this may seem intimidating, but it is manageable with a bit of attention and effort, and the setup is flexible and stable. If you need to reboot the server or the Hapi, this setup is preserved.

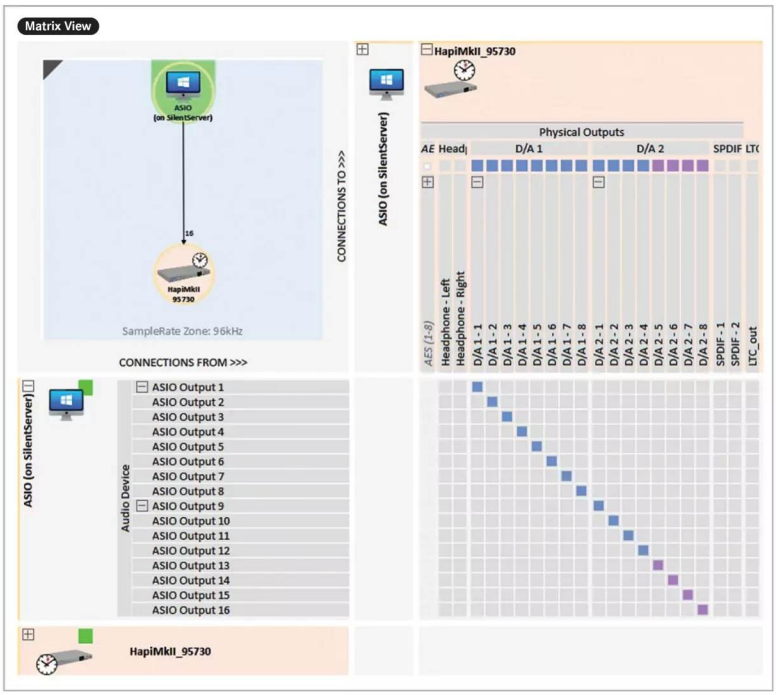
Up and running

Now that I set it up, as a 16-channel DAC with channels mapped, the Hapi serves as a 16-channel DAC—nothing more—so I have little direct interaction with it. JRiver or Roon serves as the user interface, just as before. Choose the album or track on the server and it plays without hiccups. Transitions between PCM and DSD are seamless. Once it's set up, it's easy to forget about the Hapi MkII.

That same, self-effacing character extends to the sound.

Let's begin with a recent recording of Robert Schumann's *Kreisleriana*, Op.16, and *Humoreske*, Op.20, performed by Jimin Oh-Havenith on an album bearing the title *inSANE* (24/96 5.1 FLAC download from Audite). The title probably alludes to the various mental disorders Schumann was diagnosed with during his short life, but no explanation is offered in the booklet. These are beautiful performances, presented in a close-up perspective but with an open acoustic ambiance. I was struck by the warmth, weight, and richness of the piano. Pictures in the booklet confirmed my suspicion that it was a Bösendorfer, recorded with a microphone array tightly clustered around the instrument. The recording venue was Konzerthaus Liebfrauen, a 500-seat concert hall converted from a Baroque church built in the middle of the 18th century, in Wernigerode, which is midway between Hanover and Leipzig in central Germany.

You can never know with certainty whether the playback of a recording is accurate unless you were present at the performance



measurements, continued

filter's output was down by 3dB at 20kHz and, as expected, its ultrasonic rolloff was the slowest of the four filters (fig.4), with the aliased image at 25kHz suppressed by 28dB.

Figs.5 and 6 respectively show the Hapi's frequency response with the Brickwall and Slow filters in greater detail. The sample rates are 44.1kHz (green and gray traces), 96kHz (cyan, magenta traces), and 192kHz (blue, red traces). The Apodizing filter differed from the other filters in having some passband ripple. Channel separation (not shown) was an excellent 113dB in both directions at 1kHz and still 110dB at the top of the audioband. Fig.7 shows the Hapi's low-frequency noisefloor as it drove a full-scale 1kHz tone with the volume control set to its maximum of "0.0dB." The level of the random noise is very low, and no AC supply–related spuriae are present.

The red trace in fig.8 plots the error in the analog output level as a 24-bit, 1kHz digital tone stepped down from 0dBFS to –140dBFS. Even at the lowest level, the amplitude error is <1.5dB, which implies very high resolution. When the Hapi

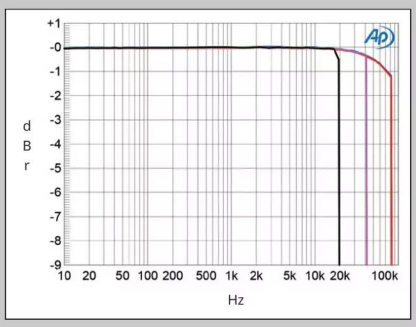


Fig.5 Merging Hapi MkII, Brickwall filter, frequency response at –12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel green, right gray), 96kHz (left cyan, right magenta), and 192kHz (left blue, right red) (1dB/vertical div.).

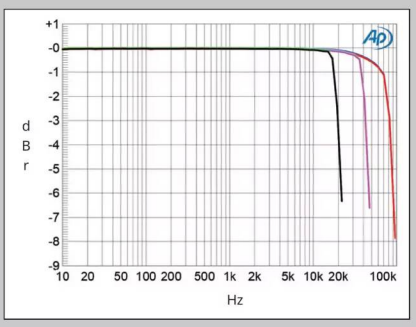


Fig.6 Merging Hapi MkII, Slow Filter, frequency response at –12dBFS into 100k ohms with data sampled at: 44.1kHz (left channel green, right gray) and 192kHz (left blue, right red) (1dB/vertical div.).

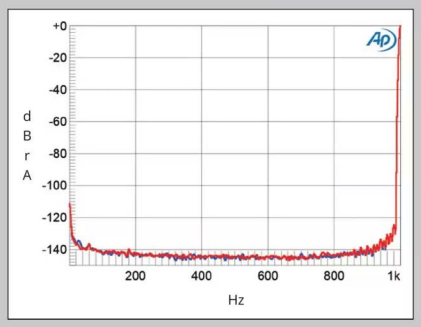


Fig.7 Merging Hapi MkII, 24-bit data, spectrum, 10Hz–1kHz, with noise and spuriae of dithered, 1kHz tone at 0dBFS (left blue, right red; linear frequency scale) (20dB/vertical div.).

and possess eidetic acoustic memory, but via the Hapi, what I hear is a Bösendorfer right there where my center speaker sits and, by gum, it sounds as if I am hearing it in the hall I see in pictures.

Apparently accurate reproduction of a Bösendorfer piano is no small achievement, but the piano is just one instrument, albeit one with wide dynamic and frequency range. A large orchestra playing Mahler is a different kind of challenge. Jason Victor Serinus favorably reviewed Rafael Payare and Orchestre symphonique de Montréal's recording of Mahler's Symphony No.5 (Pentatone PTC5187067) in the September 2023 issue of *Stereophile*.[8] His only caveat was that it "may lack ultimate transparency." Perhaps so but, listening to the 5.1 channel 24/96 download from pentatonemusic.com, I cannot fault it. The opening trumpet call leads to an orchestral explosion dominated by the full brass battery plus timpani and bass drum. The brass is clear and thrilling, and the drums pack a wallop—but try to direct your attention to the maelstrom going on in the lower strings.

Audio nerd that I am, I needed to compare this recording with some other modern recordings of this movement. None of the stereo versions could compete in sheer weight or the perceived size of the orchestra. None of the other multichannel recordings[9] revealed the interweaving surges of the cellos and basses with as much detail and the sense of proportion I heard from Payare and his Montrealers. What I heard played back via the Hapi and the rest of my 5.3-channel playback system may not be ultimate transparency—don't we always want more?—but it challenges disbelief.

It did not take symphonic power, multiple channels, or even a recent recording to demonstrate the Hapi's complete competence. That was achieved with just three instruments via the 50-year-old classic *Waltz for Debby* by the Bill Evans Trio, recorded live at The Village Vanguard in New York on June 25, 1961. Back when the recording was made, I had only a passing interest in jazz records, but much later I became hooked on the 2002 DSD remaster of this album (Analogue Productions, CAPJ 9399 SA). Now it has been remastered again, by Concord and Craft Recordings, offered on LP and as digital files. I downloaded 24/192 FLAC files, in stereo.

This recording captures a relatively intimate, though public, occasion when Evans and his colleagues communicated to the audience warmly and gently with a smile and a wink. Listening to these recordings, we feel close to the music but also to the company of listeners we have joined, whose rustlings, comments, and

8 See stereophile.com/content/september-2023-classical-record-reviews.

9 In alphabetical order, the other multichannel recordings were by Claudio Abbado, Ivan Fischer, Valery Gergiev, Helmut Haenchen, Mariss Jansons, Simon Rattle, Markus Stenz, Michael Tilson-Thomas, Benjamin Zander, and David Zinman.

decoded dithered 16-bit data representing a 1kHz tone at –90dBFS (fig.9, cyan and magenta traces), the tone was reproduced at the correct level and the noisefloor is that of the LSB-level dither. With dithered 24-bit data (blue, red traces), the noisefloor dropped by 30dB, which suggests the Hapi's DAC module offers a superbly high resolution of 21 bits. With undithered 16-bit data representing a tone at exactly –90.31dBFS (not shown), the three DC voltage levels described by the data were accurately reproduced. With undithered 24-bit data, the waveform was a clean sinewave, despite the very low signal level (not shown).

The second harmonic was the highest, at just –123dB or 0.00007% (fig.10), with the fifth harmonic slightly lower in level. This graph was taken with the Audio Precision APx555's input impedance set to the high 200k ohms. With the load impedance reduced to the punishing 600 ohms, the third harmonic was now higher in level than the second but still lay at a very low –119dB (0.00011%).

The Hapi's behavior with an equal mix

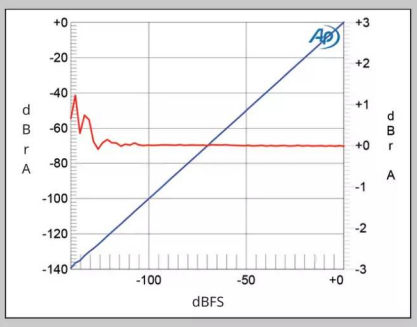


Fig.8 Merging Hapi MkII, 1kHz output level vs 24-bit data level in dBFS (blue, 20dB/vertical div.); linearity error (red, 1dB/vertical div.).

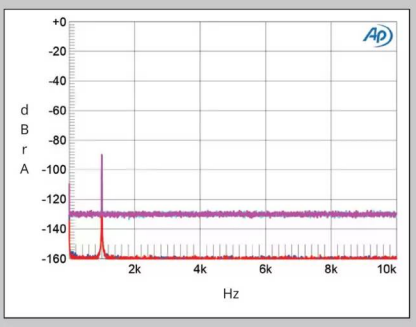


Fig.9 Merging Hapi MkII, spectrum with noise and spuriae of dithered 1kHz tone at –90dBFS with 24-bit data (left blue, right red) and 16-bit data (left cyan, right magenta) (20dB/vertical div.).

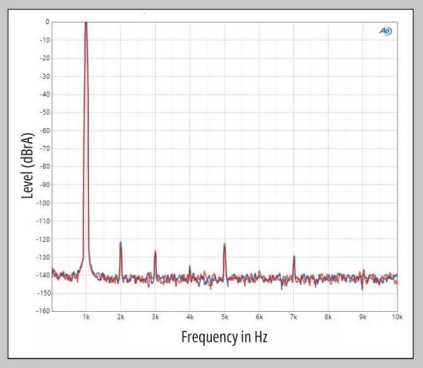


Fig.10 Merging Hapi MkII, 24-bit data, spectrum of 1kHz sinewave, 10Hz–10kHz, at 0dBFS into 200k ohms (left channel blue, right red; linear frequency scale).

cordial applause are audible. The 2002 AP version captures this but with a somewhat claustrophobic ambiance, typical of the Vanguard in the early '60s. Via the Hapi, you can almost smell the cigarette smoke. Switching to the 2023 Craft version, all that's still there, but now we are sitting at a better table. Our perspective on the musicians is less obscured. The individual instruments are more discrete, and it is easier to hear and appreciate the delicacy of the playing. Listen to the wistful "Some Other Time" and hear the amiable balance in the give and take between Evans's piano and Scott LaFaro's bass. Listen, toward the end, to the tender conversation between the piano and Paul Motian's cymbals. The Hapi honors both versions, though I'm happier with the new one.

TRPTK is a small Dutch recording company with a growing repertoire that ranges from interesting to adventurous, all of it remarkably well-performed and spectacularly well-recorded. They have aggressively expanded into immersive audio, but that's for another day. It has not escaped notice that they consistently, but not exclusively, use Merging Hapi in their recording and mastering setups. What's more, their mastering suite has five KEF Blade Two speakers;[10] I am using three Blade Two Metas in my review system. I may not possess the ears of Brendon Heinst and his team, but these commonalities suggest that I could listen to TRPTK recordings burdened by fewer elements in Floyd Toole's Circle of Confusion.[11]

As one of my Records to Die For 2020, I selected the TRPTK recording of Prokofiev's *The Fiery Angel*, with Maya Fridman on cello and Artem Belogurov on piano (DXD download, TRPTK TTK0009), a collection of themes from the eponymous opera, arranged by Fridman for cello, piano, and gong! I concluded, "It is devastatingly realistic." Played now with the Hapi and KEF Blades with which it was mastered, it is even more remarkable, but I have no better words. This is turgid, uneasy music, punctuated by moments of soaring beauty. This performance kept me gripped and agape from beginning to end. The cello and piano were frighteningly present, about 10' from my listening seat. The presence of the loudspeakers was wiped from my consciousness. The impact was stunning.

Comparisons

Functionally, the three multichannel DACs compared—the Hapi MkII, the exaSound s88, and the Okto DAC8 Pro—are all somewhat different. All three use ESS D/A conversion devices, though different ones. With each change, I tweaked the gain settings with a pink-noise signal and monitored the output with a voltmeter at the speaker terminals to be sure they were equal in level. When that was accomplished, audible differences were elusive in A/B comparisons.

I would be happy living with any of these DACs. However, I tend

10 See trptk.com/studio.

11 See stereophile.com/content/katzs-corner-episode-17-perfecting-perfection.

measurements, continued

of 19 and 20kHz tones with a peak level of 0dBFS depended on the reconstruction filter. With all the filters, the difference product at 1kHz was vanishingly low in level, at –136dB. With the Sharp and Brickwall filters (fig.11), the higher-order intermodulation products were also very low in level, at less than –120dB. As expected from fig.4, the levels of the aliased images of the two high-frequency tones were much higher with the Slow filter (fig.12), but actual intermodulation products were still very low, even into 600 ohms.

Fed with 16-bit Miller-Dunn J-Test data via TosLink, the Hapi featured superb jitter rejection. All the odd-order harmonics of the LSB-level, low-frequency squarewave lay at the correct levels, indicated by the sloping green line in fig.13, and there were no spurious tones present. With 24-bit J-Test data (not shown), the noisefloor was commendably clean.

With its superbly high resolution, vanishingly low levels of noise and distortion, and superb jitter rejection, Merging's Hapi MkII offers state-of-the-digital-art measured performance.—**John Atkinson**

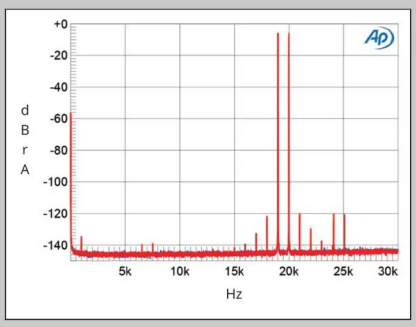


Fig.11 Merging Hapi MkII, Apodizing filter, 24-bit data, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 0dBFS peak, sampled at 44.1kHz.

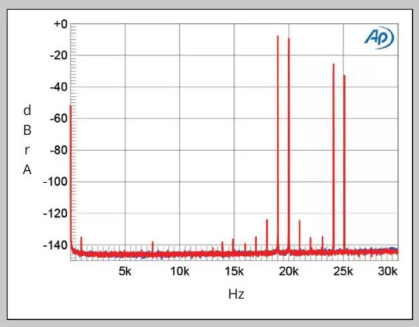


Fig.12 Merging Hapi MkII, Slow filter, 24-bit data, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 0dBFS peak, sampled at 44.1kHz.

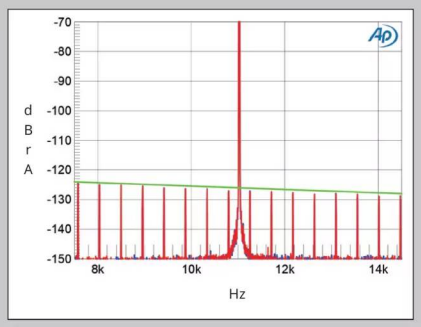


Fig.13 Merging Hapi MkII, high-resolution jitter spectrum of analog output signal, 11.025kHz at –6dBFS, sampled at 44.1kHz with LSB toggled at 229Hz: 16-bit TosLink data (left channel blue, right red). Center frequency of trace, 11.025kHz; frequency range, ±3.5kHz.

to choose the Hapi over the others due to my growing expectation of consistency and equanimity across the range of recordings. An example of what I mean: In the process of surveying some two dozen recordings of the Mahler 5, I realized how strikingly unique each recording sounded. The Hapi seemed simultaneously to favor all of them by realizing all their favorable qualities—and to favor none of them by exposing their various lapses and limitations. Crucially, the Hapi MkII, as configured, is unique in this trio in supporting more than eight channels. (Mike drop.)

Conclusions

If you have read this review from the beginning, you know that this is a professional device and not a consumer-level "plug-and-play" component. Setup requires downloading and installing a couple of apps, yet it is less intimidating to do than to read about. A one-page quick-setup sheet, which comes in the box, is all you need to get started. The downloadable, 114-page user manual will help you with the details and to solve problems. The Merging website is rich in support, with a Knowledge Base and many tutorials, docs, and downloads. All it takes to employ the Hapi to its full potential is commitment and some patience.

What you get with the Hapi MkII equipped like mine is a state-of-the-art DAC with 16 channels suitable for multichannel and immersive formats or for several actively managed, multiamped loudspeakers. The AES3 and S/PDIF inputs and outputs offer options for direct connection of sources, the addition of more channels, or direct connections to active, DSP-based speakers.

I was drawn to the Hapi MkII because of its support for 16 channels in high-resolution PCM and DSD and its high output voltage capability. I bought it based on its technical specs and its acceptance by luminaries in the recording industry, harboring the hope that it would sound as good as or better than what I already owned. It has met all these expectations and enhanced the joy and satisfaction I get from my music system beyond my expectations. ■

ASSOCIATED EQUIPMENT

Digital sources Custom Intel/Win11 music server running JRiver Media Center v31 and Roon, exaSound s88 Mark II, and Okto DAC8 Pro D/A processors. QNAP TVS-873 NAS.
Preamplifiers Coleman Audio 7.1SW for balanced DAC-to-amp switching.
Power amplifiers Benchmark AHB2, NAD C 298.
Loudspeakers KEF Blade 2 Meta (L/C/R) with IsoAcoustics GAIA II feet, Revel Performa3 f206 (SL/SR). 2 JLAudio e110 and 1 SVS SB-3000 subwoofers.
Cables Digital cables: AudioQuest Coffee (USB). Analog interconnects: Mogami Gold AES TD DB-25–XLR snake, Benchmark Studio&Stage XLR-XLR. Speaker cables: Benchmark Studio&Stage, Blue Jeans Canare 4S11.
Accessories Furman Elite-15 DM i, Brick-Wall BrickWall 8RAUD, and CyberPower 850PFCLCD UPS power conditioners, Teddy Pardo 12V power supply (for exaSound s88), HDPlex 300W linear power supply and AC filter (for server).
Listening room 24' L × 14' W × 8' H, furnished with custom-built 9" × 12" × 40" and 2" × 12" × 48" absorbent panels in each front corner. Sidewalls lateral to L/R speakers have 2" thick, 2' wide floor-to-ceiling OC 705 panels. Front wall has large windows partly covered by insulated fabric drapes. Rear of room opens into 10' × 7' foyer and a 12' × 8' dining area.—**Kalman Rubinson**

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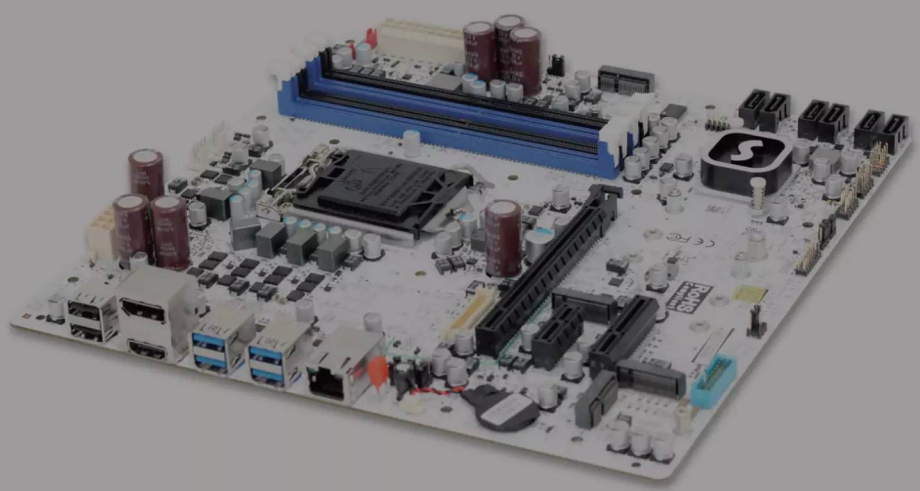

The SOtM server, with sMB-Q370 motherboard at its heart, is a much welcomed product to the computer audiophile market. It's the first Intel based motherboard with all the audiophile bells and whistles, around which listeners can craft their own computers.
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Plinius Reference A-150

STEREO/MONO POWER AMPLIFIER

When Jim Austin offered the Plinius Reference A-150 stereo amplifier ($14,995) for review, it felt like a welcome blast from the past. Plinius has, lately, maintained a low profile in the US, likely due to several changes in US distributorship.

When was the last time I'd encountered a Plinius product? I found no talk of the 40-year-old New Zealand brand between a brief mention in a 2015 column by John Marks[1] and 2022, when Robert Schryer spied a Plinius component at the Montréal Audio Fest.[2] The most recent *Stereophile* review of a Plinius component was Erick Lichte's 2011 take on the SA-103 power amplifier,[3] in which he concluded, "The Plinius SA-103 offers a natural, neutral tonal balance, just the right amount of musicality, superb bass performance, plenty of current to drive the most piggish speakers, functional and tasteful design. It is (dare I say it) a good value at its price, considering its performance."

Under the auspices of Ralph Abramo and California-based Plinius Audio Sales and Repair, Plinius's US profile seems to be rising again.

The Reference A-150, which Plinius refers to as the RA-150, isn't especially new. It was released in 2019, but it took a while to gain a substantial presence in the US market. One notable feature: It is bridgeable for use as a powerful monoblock. When so bridged, its rated power more than doubles; see below for details.

When I first communicated with Abramo, he had a single RA-150 available for review. After I mentioned my current status as a serial monoblock reviewer, he offered to send a second RA-150 a bit later, once the second amplifier had accumulated a couple hundred hours of break-in time.

In consultation with Editor Jim, I decided to do something unique in my reviewing history.[4] First, I'd listen to a single RA-150 in stereo via its balanced inputs. When the second amp arrived, I'd switch to balanced, bridged mode using the two RA-150s as monoblocks and compare the sound of stereo to mono. Why I've never done this before, only my hairdresser knows for sure.

1 See stereophile.com/content/fifth-element-91.

2 See stereophile.com/content/another-motet-room-plinius-klh.

3 See stereophile.com/content/plinius-audio-sa-103-power-amplifier.

4 Jim Austin did the same thing for his review of the Burmester 216 amplifier; see his review on p.47.

SPECIFICATIONS

Description Solid state, class-A/AB stereo/bridged mono power amplifier. Inputs: 1 pair single-ended (RCA), 1 pair balanced (XLR). Outputs: 2 pair loudspeaker binding posts. Rated output power, stereo: 150Wpc continuous into 8 ohms (21.8dBW), 250Wpc into 4 ohms (21dBW). Rated output power, mono: 450W continous into 8 ohms (26.5dBW), 600W into 4 ohms (24.8dBW). Frequency response: 20Hz–20kHz, ±0.5dB, –3dB at 70kHz. Distortion: <0.03% THD at rated output power. Output current: 50A per channel for short durations, fuse protected. Input impedance: 47k ohms. Hum & Noise: 100dB below rated output, 20Hz–20kHz (A-weighted). Gain via single-ended inputs: 32dB. Gain via balanced inputs: 38dB. Power consumption at idle: 485W (class-A); 92W (class-AB).
Dimensions 8.75" (220mm) H × 20" (510mm) W × 18" (455mm) D. Weight: 83lb (38kg).
Finish Black or silver.
Serial numbers of units reviewed 8699, 8797. Designed and built in New Zealand.
Price $14,995 each. Approximate number of US dealers: 5. Warranty: 5 years.
Manufacturer Plinius Audio Ltd., 1 Tanner St., Woolston, PO Box 19531, Christchurch 8241, New Zealand. Tel: 64 3 982 4766. Web: pliniusaudio.com.
US distributor: Plinius Audio Sales and Repair, 2994 Bangor Ave., Highland, CA 92346. Tel: (949) 357-2858. Email: info@pliniusaudio.com.

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Technical details

Abramo supplemented information in the manual via email messages and phone calls. The predecessors to the RA-150 and its top-of-the-line big brother, the RA-300, designated "SA," were designed by the late Gary Morrison more than 20 years ago. Each had a quasi-complementary output section; all the transistors were NPN.[5] In contrast, the Reference RA series, designed by Karl Willoughby, has a true complementary output section using matched NPN and PNP transistors. Abramo says this allows for more power output and delivers current faster to the output stage, faster transients, and better bass response.

In stereo, the RA-150 is rated to deliver 150Wpc into 8 ohms and 250Wpc into 4 ohms. Using a pair of RA-150s in bridged-mono is said to up the power output to 450Wpc into 8 ohms, 600Wpc into 4 ohms. A rotary switch located between XLR and RCA inputs on the amp's rear panel enables users to choose one of four settings: RCA stereo, RCA bridged mono, XLR stereo, or XLR balanced mono. Operating in XLR balanced mono, Plinius says, the Reference A-150 is a true balanced monoblock amplifier.

The RA-150 has a feature that's rare: A button on the front panel allows you to switch between "class-AB" and "class-A" settings.[6] Plinius says that the class-A setting "provides class-A bias to the output stage therefore ensuring the optimum performance of the amplifier during all listening events" and avows that "a well-designed class-A circuit has inherently lower distortion than any other design" and that in class-A operation, "there is an absence of power supply modulation common in class-AB amplifiers." The manual calls class-AB "a bias configuration used by the majority of high fidelity amplifiers," which "produces very high quality sound, suitable for all occasions where critical listening is not a priority."

As John Atkinson observed in last month's review of the Accuphase A-300, for an amplifier with this much power to operate solely in class-A—to stay in class-A all the way up to its full rated power—"would be impractical" because the heatsinks would need to be too large. As Abramo confirmed, set to class-AB, the amplifier operates in class-A up to some unspecified low power. Set to class-A, it operates in class-A up to some much higher power—also unspecified, although 50W was mentioned casually as the likely class-A/class-AB threshold. With 50W of pure class-A and reasonably sensitive speakers, most music will be reproduced in class-A, all but very loud, complex peaks.

Like any other powerful amplifier, when operating in class-A, the RA-150 runs hot. Plinius says that in class-A operation, the amp consumes "approximately 1000 watts,[7] similar to a small electric heater." It goes on to note, accurately, that class-AB allows an amplifier to run cooler and use less electricity, especially when it is turned on and music isn't playing.

States the company: "You will find that the Plinius Reference A-150 will become noticeably 'purer' in sound after being on for a period of time. We recommend waiting at least 24 hours before expecting the best quality of sound reproduction from your amplifier." Plinius also states that switching from class-AB to "class-A" operation requires only a few minutes of additional warm-up.

To further conserve electricity and lower costs, the RA-150 has a power-saving "Ecologic Control" that automatically switches from class-A to class-AB after a half-hour of nonuse. This control can be reconfigured internally to switch after 15, 30, or 60 minutes without music playing, but you'll need to open the case, which means removing and replacing 14 screws.

The Plinius Reference amplifiers include a rectifier for each rail, which allows the addition of more capacitors in the power supply, for "faster" operation. "The four capacitors in the corners of the amp on each rail provide instantaneous response, as they are placed as close as possible to the output transistors," Abramo explained. "The new design also has higher rail voltage, which increases the available current and wattage. It also has a more refined driver stage, where the low input signal is amplified, so you match the impedance to the power amplifier input buffer stage, and this contributes to a lower noisefloor. Precision DC regulators help clean up any residual AC that remains in the line stage's power supply. There are no coupling capacitors between the stages; it's all direct coupled. Direct coupling allows the amplifier to go down to DC levels and necessitates a DC protection circuit. Bypass capacitors are Audience AuriCap XO. All these things make for a better sounding amplifier [that] reveals minor details and harmonics in the music."

5 See eeeguide.com/quasi-complementary-push-pull-amplifier.

6 The Gryphon Essence monoblock, which I reviewed in the December 2020 issue, also has a class-A/class-AB switch; see stereophile.com/content/gryphon-essence-mono-power-amplifier. The Gryphon Apex Stereo, which Michael Fremer reviewed in 2022, has a three-position bias switch. See stereophile.com/content/gryphon-apex-stereo-power-amplifier.

7 After consulting with Plinius engineers, Abramo added that class-AB consumes 92Wpc compared to class-A's 485Wpc.

MEASUREMENTS

I used my Audio Precision SYS2722 system[1] for the testing. I performed complete sets of measurements on one of the Plinius A-150s that had been auditioned by JVS (serial number 8797) in both class-AB and class-A stereo modes. I then repeated the testing with the A-150 in bridged-mono mode. I preconditioned the A-150 in class-AB mode by following the CEA's recommendation of running it at one-eighth the specified power into 8 ohms for 30 minutes. At the end of that time, the temperature of the top panel was 90.7°F (32.6°C) and that of the side-mounted heatsinks 90.1°F (32.3°C).

After I finished the class-AB testing, I switched the amplifier into class-A and left it idling for 20 minutes. (An amplifier with a class-A output stage runs hottest when idling.) Although the manual says that the amplifier will become "quite hot" in class-A mode and 20 minutes is less than the time after which the amplifier automatically switches into class-AB, the temperature of the massive heatsinks was 113.8°F (45.4°C). The top-panel grilles were hotter, at 121.4°F (49.7°C). In an email, US Plinius representative Ralph Abramo told me that the class-A bias current is set for the first 30% of the specified output power of 150W into 8 ohms, ie, 50W. He confirmed that the standing DC bias current for each of the complementary output stages in class-A is the appropriate 1.4A.

The Plinius's balanced and single-ended inputs preserved absolute polarity, ie,

1 See stereophile.com/content/measurements-maps-precision.

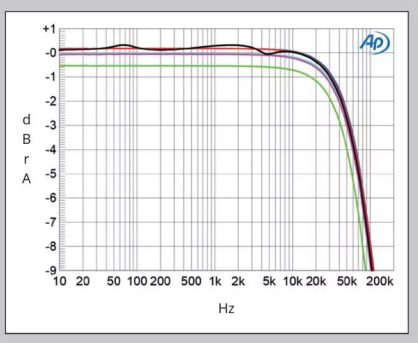

Fig.1 Plinius A-150, frequency response at 2.83V into: simulated loudspeaker load (gray), 8 ohms (blue), 4 ohms (magenta), and 2 ohms (red) (1dB/vertical div.).

At the RA-150's heart lies a 1100VA transformer. Its driver-stage power supply contains Nichicon Gold Standard low-ESR (equivalent series resistance) capacitors. Those Nichicon capacitors, which are polypropylene, "quickly release power upon demand." The RA-150 has 72,400 µF of capacitance.

What you see/what to do

On the center of the front panel, beneath the Plinius logo, sits a small, unobtrusive blue LED. When the RA-150 is plugged in and the rear-panel power switch is switched on, the LED flashes until completion of a short initialization sequence; when the power is on, it's a steady blue. If electronic errors should occur, the LED will again start flashing. During the review period, the RA-150s functioned flawlessly.

Lower down on the front panel are two buttons, side by side, above which sit two very small white LEDs. The Mute button on the left is especially useful for switching interconnects on the fly, because Mute disconnects the speaker outputs. When the amplifier first powers up, it automatically goes into Mute mode. Pressing the Mute button takes it out of mute, turns off the LED, and allows you to begin listening.

The right button, labeled "Class A," is for choosing between class-A and class-AB operation. In class-A, the LED lights. If I forgot to switch to class-AB after a listening session, the amp's "Ecologic Control" reverted to class-AB a half-hour after I departed.

The rear panel includes two pairs of speaker binding posts to facilitate biwiring,[8] and one set each of RCA and XLR input jacks. Between them lies the previously discussed "amplifier configuration selector." A power toggle switch, 15A IEC connector, remote trigger socket (for integration into a home theater/multimedia system; I didn't use it), and a ground-lift toggle switch complete the back-panel layout.

The ground-lift toggle switch has two positions: ground lift and chassis ground. States the manual, "In some installations a hum loop may exist due to duplicate ground paths from different equipment. Use this switch to remove the connection from 0V to ground thus allowing some flexibility in your particular set-up, although when using Balanced XLR inputs, the ground lift switch should always be set to 'chassis.'" Through experimentation, I learned that if you don't switch to "chassis" when using XLR cables, hum is present at levels impossible to ignore.

Setup

Plinius may surround the Reference A-150's heatsinks with aesthetically pleasing curved metal, but their bottom edges are a little bit sharp. My friend Scott, who helped with installation, had

8 For biwiring in a mono setup, care must be taken to only use the positive red binding posts.

measurements, continued

were noninverting, in both stereo and mono modes. The A-150's input impedance is specified as 47k ohms. I measured 59k ohms at all audio frequencies for the balanced input. The single-ended input impedance was 50k ohms at 20Hz, 45k ohms at 1kHz, and 36k ohms at 20kHz. The voltage gain at 1kHz into 8 ohms in stereo mode is specified as 32dB for the single-ended input and 38dB for the balanced input. However, I measured 31.3dB for both input types. For the bridged-mono mode, I followed the instructions in the manual to use the right balanced or single-ended input and to connect the positive speaker lead to the right channel's positive terminal, the negative speaker lead to the left channel's positive terminal. With these connections, the mono amplifier's gain into 8 ohms was the expected 6dB higher than in stereo mode.

The output impedance in bridged-mono mode, including the series impedance of 6' of spaced-pair cable, was a low 0.12 ohms at low and middle frequencies and 0.16 ohms at the top of the audioband. The output impedance in stereo mode was similar, at 0.135 ohms at 20Hz and 1kHz, rising to 0.16 ohms at 20kHz. As a result, the variation in the frequency response with our standard simulated loudspeaker[2] (fig.1, gray trace) was ±0.2dB. The response into resistive loads (blue, red, cyan, magenta, and green traces) was flat up to 10kHz, and then was down by 0.25dB at 20kHz and 3dB at 56kHz. The mono frequency response was identical. In both modes, there was no overshoot or ringing in Plinius's reproduction of a 10kHz squarewave into 8 ohms (fig.2).

In stereo mode, the channel separation, ref. 20V into 8 ohms, was 80dB in both directions across the audioband. With the

2 See stereophile.com/content/real-life-measurements-page-2.

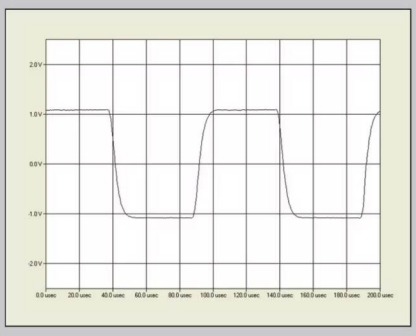

Fig.2 Plinius A-150, small-signal 10kHz squarewave into 8 ohms.

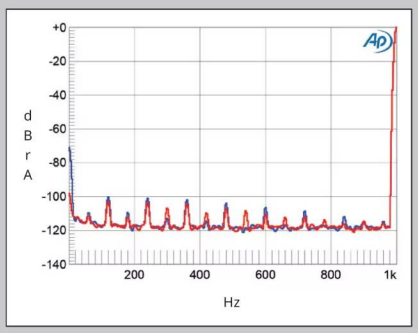

Fig.3 Plinius A-150, spectrum of 1kHz sinewave, DC–1kHz, at 1Wpc into 8 ohms (linear frequency scale).

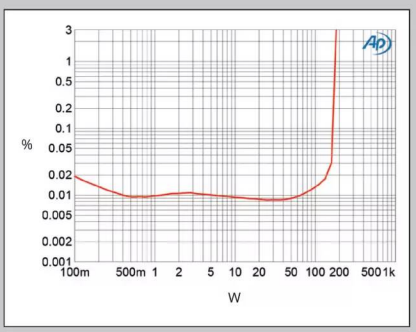

Fig.4 Plinius A-150, class-AB, THD+N (%) vs 1kHz continuous output power into 8 ohms.

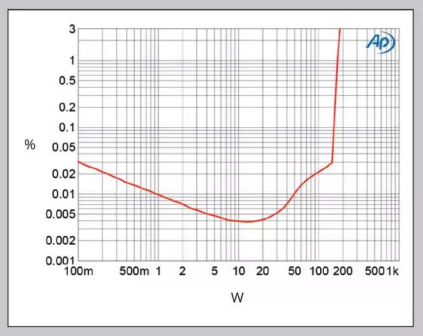

Fig.5 Plinius A-150, class-A, THD+N (%) vs 1kHz continuous output power into 8 ohms.

no problem lifting with his hands on either side of the amp, but I kept mine toward the amp's center, where the edges are smoother. Having moved several behemoths lately, it was a pleasure to handle a powerful, full-sized audiophile-grade amp that weighs only 83lb.

We placed the amps on Grand Prix amplifier stands. In place of the RA-150's supplied two-piece height-adjustable feet, I used the same Wilson Audio Pedestals I use under my D'Agostino Momentum M400 MxV amplifiers, with Abramo's blessings. Connection to my Wilson Alexia Vs was a snap.

Let there be music

Ignoring Plinius's advice, I couldn't resist a first listen immediately after hooking up the first RA-150 I received. Kudos to Plinius for speaking the truth. The amp sounded flat. 24 hours later, it sounded reborn. On advice from Abramo, I left the amps on, in class-AB mode, 24/7, so that they'd always be ready for listening.

Once warm-up was complete, it took only a few minutes to notice that in the RA-150's default class-AB setting, the sound is less than compelling. For background listening, this smooth, unobtrusive sound is nigh ideal. But if you wish to do more than set mood and tone for an evening at home, class-A is the path forward for focused listening that puts a premium on sparkle, life, and fine detail.

I went back and forth twice between two RA-150s configured for XLR bridged mono and a single amp auditioned in XLR stereo. In stereo, bass was a mite wooly on Grant Green's "Idle Moments" (24/192 FLAC, Blue Note/Qobuz), the title track from the 1965 album of the same name. Images were less weighty, and colors weren't as unique, differentiated from each other, or saturated as I'm accustomed to. On Rafael Payare and the Orchestre Symphonique de Montréal's recording of Mahler's Symphony No.5 (24/96 FLAC, Pentatone PTC5187067), complex passages sounded a bit congested. I found myself thinking about the sound more than feeling the music. On less-complex material, such as Rickie Lee Jones's never-less-than-amusing standby, "Sympathy for the Devil," from *The Devil You Know* (16/44.1 FLAC, Concord Records/Tidal), a single RA-150 did a fine job of revealing distinctions between the microphone capturing her voice and the others covering her accompaniment.

It was hard *not* to conclude that a single, stereo RA-150 would be happiest with speakers less demanding than the Wilson Alexia V. I was tempted to lug my pair of RA-150s to Scott's house to pair them with his less-demanding floorstanders and very different front end, until I realized that once we got them up his narrow stairs without breaking our necks—*if* we did—there would be no place to situate them properly. That put some sense back into my head.

As the refrain "There's No Place Like Home" played on repeat in my earworm–clogged brain, I switched to two RA-150s in bridged-mono configuration. Voilà la difference! Every instrument in Grant

chassis grounded via the rear-panel switch, the unweighted, wideband signal/noise ratio (ref. 1W into 8 ohms), taken with the single-ended input shorted to ground, was an excellent 79dB in both channels. This ratio improved to 84.2dB when the measurement bandwidth was restricted to 22Hz–22kHz, and to 86.8dB when A-weighted. These S/N ratios were 3dB lower in bridged-mono mode. Spectral analysis of the low-frequency noisefloor while the Plinius drove a 1kHz tone at 1Wpc into 8 ohms revealed a low random noisefloor, and while even-order harmonics of 60Hz were present, these all lay at or below –100dB in both stereo (fig.3) and mono modes. Lifting the chassis ground with the switch introduced higher levels of 60Hz and its odd-order harmonics. I performed all the testing with the amplifier's chassis grounded.

Plinius specifies the A-150's maximum continuous power as 150W into 8 ohms (21.76dBW) and 250W into 4 ohms (21dBW). With the clipping power defined as when the THD+noise reaches 1%, with both channels driven, in class-AB the A-150 clipped at 170W into 8 ohms (22.3dBW, fig.4) and 260W into 4 ohms (21.14dBW). The maximum power was the same in class-A, but the THD+N was lower at moderate powers (fig.5).

In bridged-mono mode, the clipping powers were 550W into 8 ohms (27.4dBW, fig.6) and 810W into 4 ohms (26.1dBW) compared with the specified 450W into 8 ohms (26.5dBW) and 600W into 4 ohms (24.8dBW). In class-A, the shape of the trace in mono mode was similar to that in stereo mode (fig.5) other than the higher clipping power.

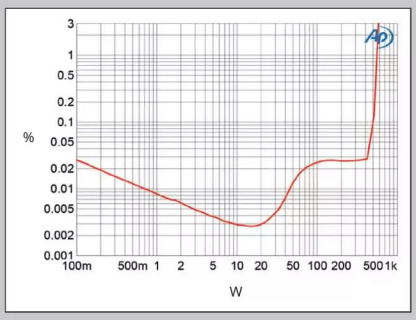

Fig.6 Plinius A-150, bridged-mono mode, class-A, THD+N (%) vs 1kHz continuous output power into 8 ohms.

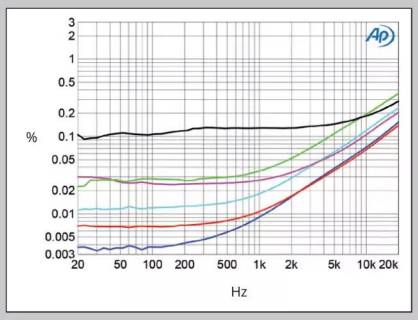

Fig.7 Plinius A-150, class-A, THD+N (%) vs frequency at 20V into: 8 ohms (left channel blue, right red), 4 ohms (left cyan, right magenta), and 2 ohms (left green, right gray).

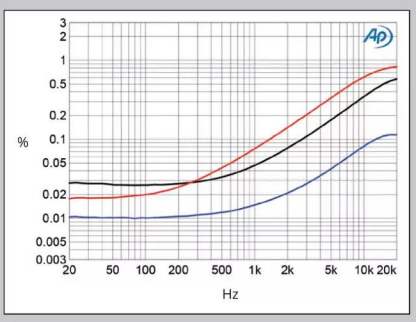

Fig.8 Plinius A-150, bridged-mono mode, class-A, THD+N (%) vs frequency at 20V into: 8 ohms (blue), 4 ohms (gray), and 2 ohms (red).

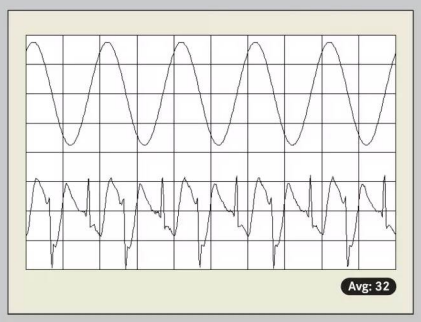

Fig.9 Plinius A-150, class-AB, 1kHz waveform at 50W into 8 ohms, 0.009% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

Green's colorful assemblage sounded smoother, warmer in the midrange, and more alive. Timbres of brushes and guitar sounded right, and bass notes were depicted with correct pitch and focus. Highs were not as smooth as through my reference, but then my reference costs $50,000 more. Rickie Lee Jones seduced me into falling in love with the devil without fear of retribution. Virtually every instrument sounded natural—I was especially taken by the sound of a fist knocking on the body of the guitar. I could have used more transparency, air, depth, sense of soundstage boundaries, silence between notes, and smoothness on top, but you must remember what I'm used to. What I did hear was very good indeed.

Bass on David Sylvian's "The Ink in the Well," from the 2003 remaster of *Brilliant Trees* (16/44.1 FLAC, Universal Music/Qobuz), sounded excellent. The trumpet tooted true, and colors were convincing. Scott, who chose the recording, wanted more space in the presentation. Thoughts of space impelled me to turn to François-Xavier Roth and Les Siècles' recording of Mahler Symphony No.4 (24/96 WAV download, Harmonia Mundi HMM 905347), where period woodwinds sounded lovely, full, and round, but air and depth distinctions were less than expected. On Yello's "Electrified II" from *Toy* (24/48 MQA, Polydor/Tidal), bass scored mightily for strength, solidity, and timbre.

One of my happiest times with the RA-150s came during the Adagietto from Payare's Mahler Symphony No.5. The blend of low- and middle-pitched strings transformed vibrating steel and resonating wood into a thing of beauty. Jumping ahead to the symphony's ultrademanding final three minutes, the balanced bridged-mono pair was able to unravel almost all the complex detail in passages where every instrument vies for supremacy and every sound

measurements, continued

In both output classes, the THD+N percentage at 20V, which is equivalent to 50W into 8 ohms, 100W into 4 ohms, and 200W into 2 ohms, was higher in the right channel (fig.7, red, magenta, and gray traces) than it was in the left (blue, cyan, green). More significantly, the THD+N percentage in both channels was higher into 4 ohms and 2 ohms. It also increased in the top audio octaves, which implies that the amplifier has limited open-loop bandwidth. At the same output voltage, the THD+N was higher in bridged-mono mode (fig.8).

The distortion waveform in class-AB had some crossover artifacts (fig.9), but these were absent in class-A, where the third harmonic was dominant (fig.10). In class-AB, the third harmonic was higher in the right channel (fig.11, red trace) and the second harmonic was present at a lower level. The third harmonic was still the highest in level in class-A (fig.12), but it is at the same level in both channels, at –80dB (0.01%). Higher harmonics were also much lower in class-A. Intermodulation distortion with an equal mix of 19- and 20kHz tones was low in level in both stereo and mono modes and in class-AB and class-A (fig.13).

The Plinius A-150's measurements indicate that class-A operation is optimal, where it offers high power with low distortion, especially in bridged-mono mode. It will perform best in both stereo and mono modes with loudspeakers whose impedance remains at or above 4 ohms.

—John Atkinson

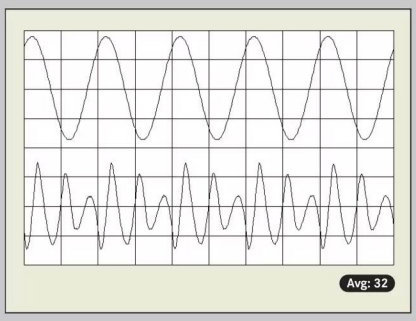

Fig.10 Plinius A-150, class-A, 1kHz waveform at 50W into 8 ohms, 0.012% THD+N (top); distortion and noise waveform with fundamental notched out (bottom, not to scale).

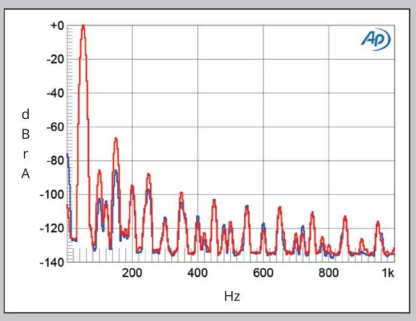

Fig.11 Plinius A-150, class-AB, spectrum of 50Hz sinewave, DC–1kHz, at 50Wpc into 8 ohms (left channel blue, right red; linear frequency scale).

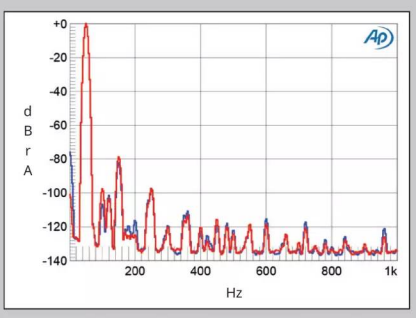

Fig.12 Plinius A-150, class-A, spectrum of 50Hz sinewave, DC–1kHz, at 50Wpc into 8 ohms (left channel blue, right red; linear frequency scale).

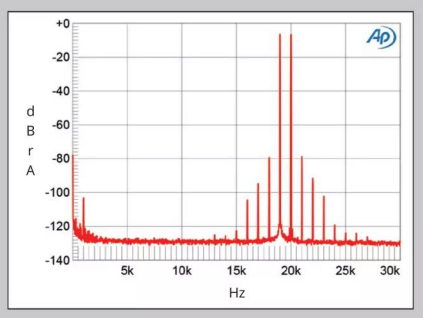

Fig.13 Plinius A-150, bridged-mono mode, class-A, HF intermodulation spectrum, DC–30kHz, 19+20kHz at 60W peak into 4 ohms (linear frequency scale).

conveys import.

Another happy moment came during *Postcards from Italy: Italian Music for Film* (24/96 WAV download, Chandos). On themes from Morricone's *The Mission*, Marco Albonetti's saxophone sounded maximally smooth, warm, and heart-touching. If the idea of a saxophone carrying the melody on multiple movie themes seems a bit far-fetched or even unpleasant, the sound Albonetti draws from his instrument may turn your thoughts around. I experienced equal delight from Richard Rodgers's "The Surrey with the Fringe on Top," sung better than I've ever heard it by Nathaniel Hackman on the new *Oklahoma!* (24/96 WAV download, Chandos CHSA 5322). Idiomatically performed by the Sinfonia of London and a stellar cast under John Wilson, this recording demonstrated how much midrange smoothness and unquantifiable charm a bridged mono pair of Plinius Reference A-150 amplifiers can deliver.

But what about ...

Comparisons! Comparisons! I hear those calls loud and clear. Scott and I, too, were eager for comparisons—but to what?

One of my favorite amplifiers came to mind, the Rotel Michi S5 dual-mono stereo amplifier[9] ($7499.99). Pricewise, a pair of Michi M8 monoblocks would be a better match,[10] though, at $13,998/pair, still significantly less than a pair of RA-150s. Alas, no one at *Stereophile* had either an S5 or a pair of M8s lying around, so those comparisons were not possible. I don't feel comfortable calling forth aural memory to draw comparisons between the Plinius RA-150 and the Rotel stereo amp, which I reviewed with a different music streamer and streaming network, a different DAC, different reference monoblocks, different speakers, different power treatment, different electrical system and network setup, and different room treatment. But I remember it fondly. If you're shopping in this broad price range, the S5 (and its M8 stablemate) would be an alternative to consider.

What I did recall clearly were the wonderful-sounding Accuphase A-300 monoblocks I'd just reviewed. Though much more expensive at $51,900/pair, they are significantly less powerful than the Plinius, rated to produce 115W into 8 ohms or 250W into 4 ohms. Also on hand were my more powerful, much more expensive reference D'Agostino Momentum M400 MxV monoblocks.

Power is not in itself a measure of quality, let alone joy. The Accuphase monoblocks produce a sound so ingratiating, seductive, and satisfying that it puts them in a different class. Whether you find paying an extra $21,000 seductive is another matter entirely. This competition isn't fair.

In summation

As labor-intensive, time-consuming, strenuous, and challenging as accurate measurement can be, it is easier to draw meaning from numbers than it is to quantify feelings. But put together, the two approaches can help shed light on the mysteries of musical reproduction. I look forward to reading JA's technical assessment.

I had many pleasurable listening experiences with the Plinius RA-150. A better match for my speakers in bridged mono configuration than in stereo, a pair of RA-150s delivered abundant midrange warmth, fine bass, true timbres, and emotionally compelling sound. With less-demanding speakers, a single stereo would likely approach this level of performance. If you're in the market for an amp of its quality and price, the Reference A-150 deserves a serious listen. ■

9 See stereophile.com/content/rotel-michi-s5-power-amplifier.

10 See stereophile.com/content/rotel-michi-m8-monoblock-power-amplifier.

ultra-earspeakers

Imagine a true ultra-high-end system using the finest headphones which rivals large physical hi fi systems at upwards of over USD$1M at a fraction of their cost...but which also is a desirable objet d'art. This is the "Ethereal System".

No stranger to creating objects which never existed before, artist/engineer Kostas Metaxas has also managed to marry a Swiss Tourbillon [L'Epee] clock and offer it as a beautiful abstract moulage mannequin.

The CNC's casework also features one of Kostas' patternation called "Geometrika" which creates a visual patina of squares and rectangles recessed into an organic shape - requiring the most advanced 5-axis CNC machine to create it. Other patternations will be offered similar to those used in Kostas' Haute Creation work for S.T. Dupont of Paris.

Inside the case are two entirely mono ultra-low-noise high voltage purely discrete and utterly balanced amplifiers dedicated to electrostatic headphones running at over 1000V peak-peak. The Bias voltage of 580V [standard for STAX, SENHEISSER etc] is absolutely ripple-free and running at high frequencies to avoid any interference with the delicate audio signals.

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AURAL ROBERT

BY ROBERT BAIRD

THIS ISSUE: A reissue of the Replacements' *Tim* fully realizes the album's great potential.

Tim: Let It Bleed Edition

Having just finished this review of The Replacements' *Tim: Let It Bleed Edition*, I thought I'd glance at a couple of online forums to see what the collective verdict was on the sound quality of the set's main attraction: a remix of the album by Ramones engineer Ed Stasium. At Steve Hoffman's forums, I saw this in one of the first posts: "It sounded like I expected *Tim* to sound when it came out in the fall of 1985. I've also listened to the newly remastered original album that comes with the set, and while it sounds good and I'm glad to have it, it pales compared to the 2023 Stasium mix." Ticking down a post or two, exuberance gushed forth: "Well, IMO the [Stasium] version of *Tim* may be the greatest rock record of all time."

Forums are fight clubs for the bored or pugnacious, and squabbling is often the point. Audiophile scrums are among the nastiest. Name calling often ensues; gene pools can be disparaged, personal hygiene called into question. But across the spectrum of those who care how recorded music sounds—from the slightly interested to those who live for the fight—nearly everyone seems to agree that Stasium's remix, featured here on both CD and LP, is a genuine revelation in terms of tempos, dynamics, and adding new life to the music. It is exceedingly rare for a masterpiece album, adored by most critics on its initial release, to be sonically recast so radically.

This deluxe *Tim* reissue includes four CDs, an LP, and a booklet with extensive liner notes. CD 1 has the Stasium remix of *Tim*. A second includes the original mix by Tommy Erdelyi (aka Tommy Ramone), newly remastered by Stasium; A–B comparisons have never been easier. There's a CD of demos and alternate versions. The fourth CD contains a live show from 1986.

A guitar player–turned–audio engineer, Stasium has a varied resume. He was the engineer behind Gladys Knight and The Pips' hit single "Midnight Train to Georgia," and he recorded the Ramones' *Leave Home*, *Talking Heads: 77*, Living Colour's *Vivid*, and Motörhead's *1916*.

Antiheroes always terrified of success, The Replacements were as much Faces and Big Star as they were New York Dolls and Sex Pistols. Recently, because of a series of classy reissues, they've become a cause célèbre among those who mourn the current sorry state of guitar-band rock. Those early Replacements albums, though, were sonic calamities. Initially the 'Mats (for "placemats" as they were affectionately known by their fans), were fans of the lo-fi sound favored by the punk-rock faithful; the intricacies of recording were beyond them and also their hometown label, Minneapolis-based Twin/Tone Records. Consequently, the mixes were often muddy and inconsistent.

When the band moved to Seymour Stein's Sire Records in 1985, their recordings became audibly better. But to those in love with the Replacements' reckless abandon, the new professionalism detracted from the mêlée and self-sabotage that made them so admirably pure. They weren't doing it to be rock stars, the legend went: They genuinely didn't care. The move to Sire opened a split among 'Mats fans: those who prefer the early punk-rock cacophony versus those who thought the more precise Sire sound was a vast improvement.

At least on the online forums expressing opinions about the Stasium *Tim* mix, that split has almost entirely disappeared.

The new mix is infinitely sharper. Tommy Stinson's bass roars, and Chris Mars's drums are more resonant. The entire mix is somehow louder while also being spread across a much wider soundstage. Stripping away much of the reverb has sharpened the attack of Bob Stinson's guitar. Paul Westerberg's vocals are clearer and not as dry as in the original. Previously muffled details are unearthed, such as the guitar part between the first and second verses of "Bastards of Young." The clarity brought to the cello and piano parts in "Here Comes a Regular" is a welcome addition. Perhaps the most surprising improvement is how the layered mix has changed the perception of "Dose of Thunder" from a near throwaway—a tune to skip past—to another of this album's classic moments. One misstep: Bob Stinson's guitar parts at the end of "Little Mascara" don't add much.

To my great surprise, the best part of this reissue is the disc of demos and alternate takes, *Sons of No One: Rare and Unreleased*. Usually, demos are boring, but here they show four versions of Westerberg trying hard yet failing to work out "Can't Hardly Wait," which eventually appeared on 1987's *Pleased to Meet Me*. For those who cherish memories of the live mayhem, or who never saw the band, there's the 28-track show recorded in 1986 at Chicago's Cabaret Metro. The sound is thin and often flat, but the manic energy crackles.

This new mix has inevitably given fresh life to the endless speculation about whether the 'Mats could have ever been a "big" act as successful and well-known as Tom Petty & The Heartbreakers or Bruce Springsteen. Could they have ever gotten serious without losing the snottiness and indifference that was their superpower? *Don't Tell a Soul*, their third Sire album and the last that can be considered a band record rather than a Westerberg solo project, smoothed many of their erratic charms, but it was considered a sellout by fans and so became their self-immolation.

Snarkily named after a rock avatar like their Twin/Tone album *Let It Be*, the *Let It Bleed* version of *Tim* proves how serious they became about making something lasting. Finding love, not sales, was their aim. Along the way, these loveable losers, often drunk and disorderly yet awash in sneaky chemistry and Westerberg's formidable songwriting ambitions, accomplished marvelous feats. One of those feats can now be heard clearly for the first time. ■

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REVINYLIZATION

BY KEN MICALLEF

THIS ISSUE: Analogue Productions presents the best version ever of a classic audiophile LP.

Steely Dan's *Aja*

In the 1970s, Steely Dan produced hit records for a listening public that could care less about the band's cryptic lyrics. Those early Dan fans responded to their songs' epic choruses and glistening hooks, awarding chart-topping success and a global audience.

From 1972's *Can't Buy a Thrill* to 1980's closing act *Gaucho*, Bard sages Walter Becker (1950–2017) and Donald Fagen occupied a place in pop music as unique as their songs' references to "wild gamblers," "midnight cruisers," "bodacious cowboys," and a female protagonist who "prays like a Roman with her eyes on fire." Much later, Becker and Fagen returned to the studio, issuing *Two Against Nature* to an audience still hungry for their singular R&B- and jazz-based music.

Music Matters founder Ron Rambach told me years ago, in an interview for *DownBeat* magazine, that he hoped to reissue the Steely Dan catalog. But UME/Geffen decided to do it themselves, releasing digitally sourced vinyl. For audiophiles, they outsourced LP production to Analogue Productions, which has produced all-analog UHQR versions. Production was overseen by remaining Major Dude Donald Fagen.

Aja, Steely Dan's 1977 masterwork, was produced by Gary Katz and engineered by the dream team of Bill Schnee, Roger Nichols, Al Schmitt, and Elliot Scheiner. Sparkling with perfectionist sheen, *Aja* is packed with quixotic songs performed by the Dan and such elite session technicians as Jim Keltner, Victor Feldman, Joe Sample, Chuck Rainey, and Larry Carlton. *Aja* has been recently reissued in two distinct versions: the digitally sourced Geffen series (Geffen/Ume B0035028-01) and all-analog Analogue Productions UHQR (AUHQR 0014-45). Both versions were remastered and cut by Bernie Grundman.

"Our signal path was the most straightforward way that could be used to cut the lacquers," Bernie Grundman wrote in an email in response to my query about the two recent *Aja* versions. "We went straight into the cutting system"—a Scully lathe—"and used our diamond stylus for the cut. The signal path was really clean. Our system was built to be as clean as possible, as electronics added to the signal path can cause losses in quality. All the gear we use was built by our techs or customized. Thomas 'Beno' May is our chief tech."

I received both *Aja* reissues. An original 1977 *Aja* (ABC Records AA-1006), a 1980 Mobile Fidelity LP (MFSL 1-033), and a 1980 Japanese cut (MCA Records VIM-4039) were on hand for comparison.

Adding to its broad stereo spread and precise image placement, the original *Aja* is packed with iconic sounds: Rainey's coiling electric bass; Fagen and Sample's glowing Clavinet, Rhodes, and synthesizers; Feldman's vibraphone radiating Ellingtonish chords over "I Got the News"; Keltner's reverberating trash can lid in "Josie." The sounds warm and wet, at times muffling bass instruments but pleasantly goosing the midrange like the soft center of a Three Musketeers bar. Not the last word in resolution but with excellent presence and impact, MCA Records VIM-4039 is easy to enjoy.

God bless Bernie Grundman. The newfangled *Aja*s, which sound similar, bring *everything* into greater focus, with a stark but naturally clean presentation, boundless dynamics, and noticeably more energy. These new versions have weight and extension similar to the MoFi and Japanese versions but additional viscosity, instrumental separation, front to back layering, newly exposed details, and surprising texture. This *Aja* sounds quieter, richer, *riper*.

OG *Aja* delighted everyone from Maggie/McIntosh-espousing audiophiles to 8-track connoisseurs.

The gatefold jacket of the MoFi *Aja* was heavy and thick, predating the Music Matters/Tone Poet rage by 46 years. This version soups up *Aja*'s top and bottom ends. It brings airier resolution to cymbals and guitars and battleship weight to electric bass and bass drums. On "Peg," Rainey's bass guitar was revealed in all its slapping proficiency. In "Home at Last," Bernard Purdie's original bass drum "thud" is replaced by a seismic, slamming punch. The MoFi has greater soundstage width and depth, but there is something unnatural in its drastic peeling of the music's tonal extremes. It is great fun, nonetheless.

The Japanese *Aja* brings thick cream and candylike goodness, as if my toes are running through an orange shag rug as I recline in a plush Naugahyde sofa. But what's not to love? As substantial as the MoFi but with added sweetness and depth, this record It makes me want to dance—and Kenny don't dance! I can hear only minimal flaws: occasional digital glare and transients that sound a little bit unnatural—a small price to pay for this much excitement.

Dead silent and uncluttered, the UHQR uncovers a wealth of new detail. Each instrument occupies a larger physical space, like the effect of a good SET amp. There's more depth, improved sustain, and improved definition of instruments within the ambient space. Instruments possess more personality—there's more sonic information—from Rainey's bass through Carlton's guitar to Fagen's quirky Rhodes and synths. The UHQR's deep silence uncovers surprising subtlety and nuance in Fagen's typically squeezed, nasally vocals, making him sound more '60s Beat Poet, less snarky LA hipster. This *Aja* has a deeper focal point and a more relaxed presentation, facilitating a more immediate and satisfying experience.

The OG *Aja* still sounds great. The Japanese version is pure '70s velour and Kodachrome. The new digitally sourced LP brings the record into the modern era. The UHQR, though, imbues this timeless music with new grace and beauty. There will never again be a reason to "go back, Jack, do it again," though no doubt someone will. ■

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REDISCOVERIES

BY TOM FINE

THIS ISSUE: New, remixed versions of two classic Beatles compilations.

Old is new, golden Red and Blue

The first Beatles music is more than 60 years old, and the group broke up 53 years ago. Yet they and their music remain relevant. So when Apple Corps announced "The Last Beatles Song," on October 26, the world's media ran with the story.[1]

Beatles fans span at least four generations, and the group's promotion machine is looking to hook today's youth, and perhaps rekindle old flames, with 50th Anniversary deluxe reissues of the "Red" (*1962-1966*) and "Blue" (*1967-1970*) compilations. These expanded editions—12 new tracks on *Red* and nine on *Blue*, including the new-old single "Now & Then"—sport remixes performed since 2015. The most recent prior reissues of *Red* and *Blue* were in 2010, using the 2009 transfers of The Beatles' original master tapes. They were first issued on CD in 1993.

If you're a Boomer, you may have experienced Beatlemania first-hand. A Gen Xer, I dove into Beatles music after the fact, initially through the original, two-LP *Red* and *Blue* sets from 1973. Millennial fans were likely pulled in by the first CDs, or the swirl around the 2009 reissues, or when the Beatles catalog became available on iTunes. Younger folks may have been hooked by the *1* compilation in 2000 or the post-2015 reissues.

Each of these gateways into Beatles music comes with a different sonic perspective. The original LPs sound different from the 1980s versions, and the original CDs sound different from the 2009 remasters. All the earlier versions sound different from the remixes and remasters that started in 2015.

The new LP sets, now three platters, begin with the same running order as the original two LPs, with extra songs on the third disc. The new two-CD versions place the extra tracks in chronological order, so the sequence is different from what we're accustomed to, which may or may not be jarring.[2]

More jarring may be the remixes. On the new *Red*, 30 of 38 songs are newly remixed; the rest were remixed for the 2022 reissue of *Revolver*. The new *Blue* features six brand-new remixes plus "Now & Then." The rest of the *Blue* tracks were remixed between 2015 and 2021, for reissues from *1+* through *Let It Be*.[3]

The remixes sound quite different from the originals, especially the early material on the *Red* album. Reissue producer Giles Martin has used the "demixing" technology developed by Peter Jackson's WingNut Films to take apart mono mixes and individual tape tracks containing multiple instruments and voices, separating out each instrument and voice onto its own digital track, then remixing the songs. Voices and instruments end up in different speakers and at different relative volume levels compared to the original releases. Whether you prefer this will depend on your own aural memories and listening aesthetic and will likely vary from song to song.

On the original *Red*, the opening track, "Love Me Do," was the version with Andy White on drums and Ringo Starr on tambourine. On the 1973 LPs, it was fake stereo; it was the original mono on the 2010 CD version. On the new *Red*, the original mono single version, with Ringo on drums and no tambourine, was demixed and remixed to a sparse stereo spread.

"She Loves You" has a weird, high-pitched halo around the vocals that may be sonic artifacts from the demixing. If you grew up on the stereo LPs or CDs, be prepared to hear instruments in different speakers than you're accustomed to. Vocals tend to be in the center and more prominent; drums often but not always move to the center from one of the sides. The low end tends to be more prevalent than on even the 2010 version, which was already heavier and louder than the first-edition CDs and the original LPs. Loudness-wise, the new versions stand up to contemporary pop music, which is to say, they're loud. That's okay: Beatles music was intended to be loud and exciting—to jump out of 1960s radio speakers—so these songs never had a big dynamic range. Now the songs have gone from loud to louder.

If you've followed the recent reissues of the Beatles catalog, from *Sgt. Pepper* onward, you'll know what to expect on most of *Blue*. The remixes of the later albums have tended to be similar as far as what sounds are where in the stereo image, but bass and drums are heavier and vocals are clearer and more forward in the mix. However, the remixes of "Strawberry Fields Forever" and "I Am the Walrus" sound quite different from those earlier remixes, to the point that the psychedelic sound collages are not the same as in the original mono or stereo mixes. The same is true of the *Revolver* track "Tomorrow Never Knows," now the final track on *Red*. If one considers the sound collages as distinct parts of the song, alongside melodies and arrangements, you may find these alterations a bridge too far.

As of now, the 2009 remasters, plus the more recent remixes, are all available for streaming. This makes it easy to compare and decide whether you prefer the original or new versions of your favorite Beatles tunes. At the time of this writing, the 2010 *Red* and *Blue* albums were streaming, so hopefully Beatles fans of all ages will find it easy to compare song by song and each of us decide whether we favor the old or the new. ■

1 See bit.ly/40gF1gj for *Stereophile*'s coverage, including an exclusive interview with remixing engineer/producer Giles Martin.

2 See bit.ly/NewRedBlueTracks for the new *Red* and *Blue* track listings with remaster dates.

3 *1+* was the deluxe edition of *1*, complete with Blu-ray. See bit.ly/40iBAWb for a detailed history of Beatles remixing/remastering since 2015.

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RECORD REVIEWS

EDITOR'S PICK

RECORDING OF THE MONTH

SHOSTAKOVICH
Symphonies Nos. 2, 3, 12 & 13

Boston Symphony Orchestra, Andris Nelsons, cond.
Deutsche Grammophon 4864965 (3 CDs) (reviewed as 24/96). 2023.
Shawn Murphy, Nick Squire, prods.; Murphy and Squire, engs.
PERFORMANCE ★★★★★
SONICS ★★★★★

Auditioned with the bloody conflicts in Ukraine and the Middle East as a backdrop, these riveting, superbly recorded performances confront listeners with the inescapable ravages of war. They also open a window on the shifting political convictions of one of the greatest composers to emerge during the early years of the Soviet Republic, Dmitri Dmitriyevich Shostakovich.

The premiere of Shostakovich's Symphony No.2 in B major, Op.14, "To October," took place toward the end of 1927, soon after his 21st birthday. A celebration of the 1917 Russian Revolution, it and the Third Symphony, whose premiere followed a little more than two years later, reflect Shostakovich's belief in Soviet-style Communism. The Second is wild, brash, experimental, and an embodiment of the ideology the composer then felt essential to music. It assaults us with one ravishing percussive barrage after another, punctuated by choruses and sections of strange beauty.

The Third Symphony, which celebrates May Day (the Workers' Day of International Solidarity), ends with a chorus proclaiming an overtly political message. It again shows Shostakovich trying out different musical ideas while attempting to conform to the state's demands that music speak to the proletariat. If it and its predecessor are not frequently performed, it is because they are the products of an irrepressibly inventive and increasingly rebellious composer who has yet to find the voice and language we associate with his Fifth symphony and later works.

The first attack on Shostakovich's music by the Russian Association of Proletarian Musicians took place in 1929, but it was only after Soviet dictator Joseph Stalin attended the opera in 1936 to hear *Lady Macbeth of the Mtsensk District* that attacks on the composer's music began to appear in the state-controlled newspaper, *Pravda*. From then on, Shostakovich lived in fear of persecution, imprisonment, and death, although there were periods of reprieve and even triumph. Another terrible period began in 1948, when the Supreme Soviet of the Russian Federation denounced the "formalistic," nonproletarian tendencies in Shostakovich's music and that of other composers.

In Symphony No.12 in D minor, Op.112, "The Year 1917," Shostakovich revisits the Russian Revolution. Composed in 1961, the year he turned 55, it is an attempt at "Soviet Realism" that perhaps reveals more about the composer's state of mind than he dared proclaim. As much as it celebrates Lenin and the events of 1917 that culminated in the Bolshevik Revolution, the 55-minute work is hardly the straightforward celebration of victory that the subtitles of its movements might suggest.

The biting irony of the Twelfth's final movement, *The Dawn of Humanity*, reveals the composer's faith-shaking awareness of the contradictions between theory and practice. Even if Shostakovich intended its tremendous finale as a celebration of the Soviet Utopia, he could barely restrain the sense of irony that produced some of the most macabre, grotesque, and circus-like music of the 20th century.

A year later came the long Symphony No.13 in B flat minor, Op.113, "Babi Yar." Shostakovich began composing the symphony as a response to the 1941 massacre of tens of thousands of Jews by Nazis in a ravine near the Ukrainian capital, Kiev, setting a poem by Soviet dissident poet Yevgeny Yevtushenko. The first movement became a broad condemnation of antisemitism including that endemic in the Soviet Union. Eventually Shostakovich set five poems by Yevtushenko over five movements addressing issues as disparate as attempts to shackle culture, the hardships of Soviet women and Soviet suppression broadly, and the evils of bureaucracy. Even in the midst of the Khrushchev thaw, a work like this from such a prominent artist attracted critical attention. Shortly after the premiere in December 1962, Premier Khruschchev demanded changes.

Here, with the tenors and basses of the Tanglewood Festival Chorus and New England Conservatory Symphonic Choir joined by the magnificent bass-baritone Matthias Goerne, Nelsons and the Boston Symphony Orchestra bring home the horrors of war. Goerne's profound conviction and vocal mastery are awe-inspiring, and this rendering of the symphony's condemnation is soul-shaking. The wonders of this music lie as much in its sheer force and endless inventiveness as in its alchemical journey from bloodshed to mystical sadness and stillness. A must! **—Jason Victor Serinus**

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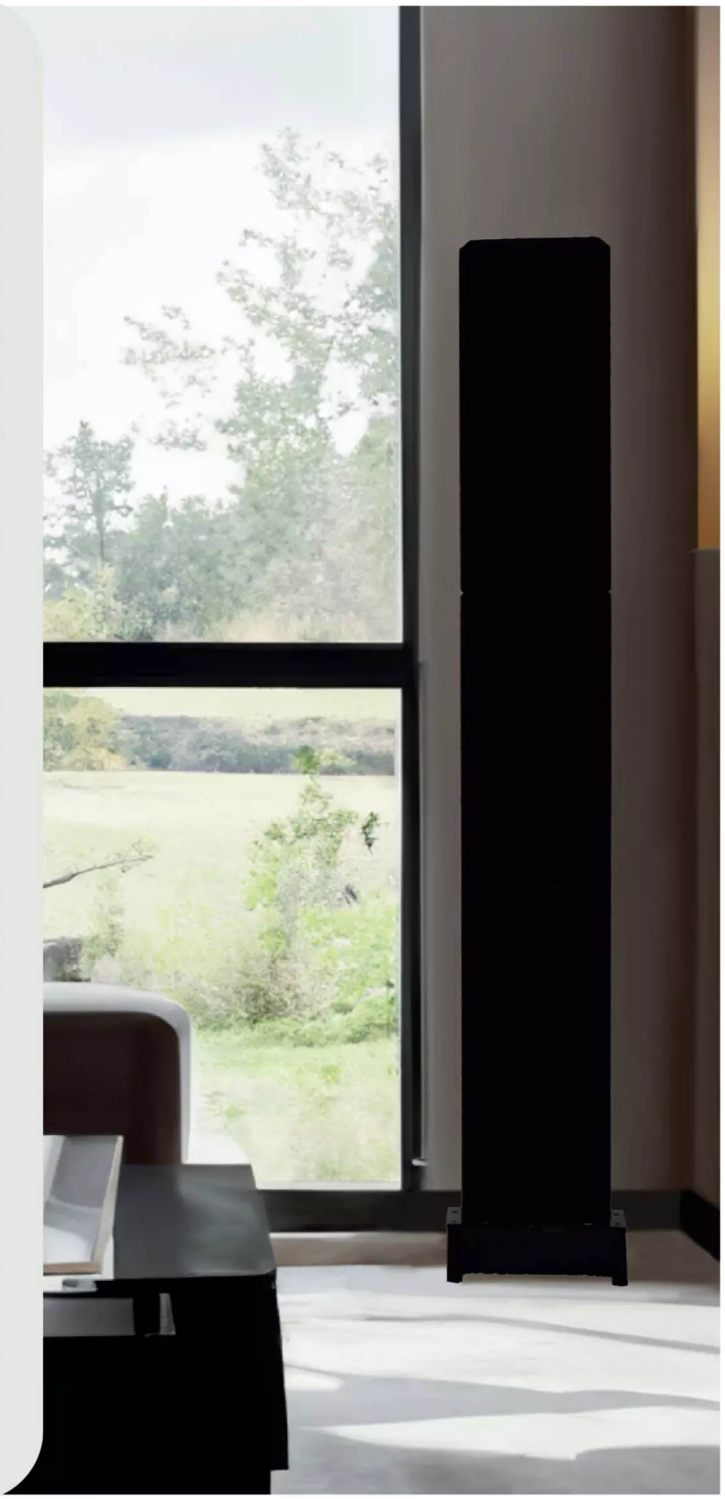

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ROCK/POP

GRATEFUL DEAD
Wake of the Flood, 50th Anniversary Deluxe Edition

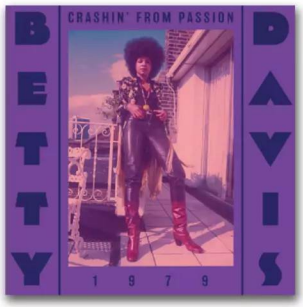
Grateful Dead Records/Rhino Records R2 721375 (auditioned as CD). 2023. Grateful Dead, prod.

PERFORMANCE ★★★★★
SONICS ★★★★★
LIVE AT NORTHWESTERN ★★★★½

The Grateful Dead's 1973 album *Wake of the Flood* is notable for many reasons. It was the first record released on the band's own label, Grateful Dead Records, and it was the first studio album without keyboardist Ron "Pigpen" McKernan (who had just passed away) and drummer Mickey Hart (who was on a hiatus). In Pigpen's place arrived the husband-and-wife combination of Keith and Donna Godchaux. Together, they helped songs like "Eyes of the World," "Stella Blue," and "Mississippi Half-Step Uptown Toodeloo" quickly become live-set staples. *Wake* ushered in a new era of the Grateful Dead, one defined by a sense of independence and musical freedom.

The record is now celebrated with a special 50th anniversary edition, newly remastered and expanded with previously unreleased demos of "Eyes of the World" and "Here Comes Sunshine," and a bonus disc of live material from the final night of a tour that followed *Wake of the Flood*'s release. The package was produced by Grateful Dead Legacy Manager and Audio Archivist David Lemieux, with liner notes by former Grateful Dead archivist Nicholas G. Meriwether.

The remaster gives the record added warmth and greater clarity. It better delivers the creative shift taking place, rendering it more approachable and less demonstrative than previous studio material. Horn parts deliver brassier rhythmic bumps, and string arrangements are lusher. The live record presents great renditions of Dead classics like "Playing in the Band," but the mixing is uneven; at times the vocals sit well behind the balance of the band. Still, the package wonderfully presents a band in transition, setting a different kind of studio course and making music that they and other jam bands would mine for the next 50 years.—**Ray Chelstowski**



CRASHIN' FROM PASSION
Betty Davis

Light in the Attic 196-1-1 (LP). 2023. Davis, Keg Johnson, Matt Sullivan, Danielle Maggio, prods. and engs., reissue prods.; Davis, Johnson, Dave Cooley, engs.

PERFORMANCE ★★★★½
SONICS ★★★★½

Betty Davis was a singular musical artist, embracing forward-looking visions of funk, fusion, and fashion. She's credited with turning then-husband Miles Davis on to Jimi Hendrix, and her "nasty girl" persona, in which she growled lines and prowled the stage, cut a trail for the many female performers who followed her.

Writing and arranging all her songs, she released three albums in the early '70s; the last was *Nasty Gal*, from 2005 on Island Records.

Two sessions followed, both originally unreleased. The first, from 1976, *Is It Love or Desire*, appeared on reissue label Light in the Attic in 2009. In her final recordings from 1979, Davis corralled an all-star band led by bassist Chuck Rainey, drummer Alphonse Mouzon, and pianist Herbie Hancock. The Pointer Sisters and Martha Reeves added background vocals.

Those final sessions were released without Davis's knowledge in 1995 as an album called *Crashin' from Passion* . Newly remastered and approved by Davis before her death in 2022, this is the album's first official release.

Pressed at RTI in several colors (though not at 180gm weight), *Crashin'* shows Davis moving toward a softer soul sound. While the opening track, "Quintessence of Hip," is hard funk, "She's a Woman" has Davis, who was more talker than singer, sweetly cooing her way through lyrics that plead, "Shower me with orchids if you're/Gonna touch my emotions." Led by Hancock's piano, the flowing funk of "Hangin' Out in Hollywood" finds Davis partying: "I'm swing so good, hangin' out in/Hollywood/I just met me a movie star, flyin' high/in a Ferrari car."

With newly remastered sonics, these sessions do not sound dated. They prove once again that Davis's music was far ahead of her time.—**Robert Baird**

X-RAY SPEX
Conscious Consumer

Do Yourself In Records DYI1027LPC (LP). 1995/2023. Poly Styrene, prod.; Shawn Joseph, eng.

PERFORMANCE ★★★★½
SONICS ★★★★½

X-Ray Spex split up in 1979. It was a pleasant surprise when, in 1995, seemingly out of nowhere, the band reformed. Vocalist Poly Styrene was united again with Lora Logic (the original saxophonist), and bassist Paul Dean. The recorded result was called *Conscious Consumer*.

Not many noticed this CD-only release, which after all was from an aging punk-rock band, coming in the midst of the Brit-Pop media storm. Old punks—the few who noticed—were aghast at a tuneful, restrained Poly Styrene and pined for the rawness of "Oh Bondage Up Yours!" *Conscious Consumer*, though, is a fantastic album. It's criminally neglected. This reissue is warmly welcomed.

The first thing you notice is Poly Styrene's voice: She sounds young and enthusiastic. The vocals are almost bubble-gum pop. There's a freshness about the music, almost a naiveté. It almost sounds like Wet Leg (or, rather, Wet Leg almost sounds like this)—especially the humor in "Good Time Girl" and "Hi Chaperone." Logic's sax is high in the mix, alongside the vocals; sometimes it sounds like a duet.

The themes were, and are, familiar to fans of the earlier edition of X-Ray Spex. Many of the songs are concerned with consumerism, as the title suggests. The sound may be light and bouncy, but the lyrics are serious.

The first two tracks ("Cigarettes" and "Junk Food Junkie") swing, yet the focus is on unhealthy living: Poly Styrene could still write a lyric that bit. Environmentalism is the concern on "Melancholy." It, like "India" and "Peace Meal," reflect Styrene's and Logic's Hare Krishna faith. Not that Conscious Consumer is a glum listen. "Crystal Clear" is a beautiful song. The overarching message of the album is peace and goodwill to all. The songs have something to say, but they're incredibly catchy.—**Phil Brett**

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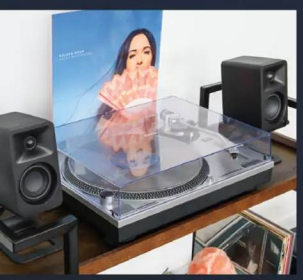

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ROCK/POP

CAT POWER
Cat Power Sings Dylan: The 1966 Royal Albert Hall Concert

Domino WIG524 (WAV). 2023. Chan Marshall, Andrew Slater, prods.; Rob Schnapf, Matt Schuessler, Ollie Nesham, Pete Panagaris, Eduardo Puhl, engs.

PERFORMANCE ★★★½☆
SONICS ★★★★★

In May 1966, Bob Dylan played the Manchester Free Trade Hall. After an acoustic first half, he famously returned to the stage after an intermission backed by The Hawks, who later became The Band, and went electric. The crowd heckled him after each song, and a rock legend was born.

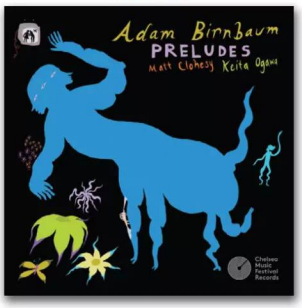
Condemned as a sellout at the time by purists, the concert has come to be seen as a seminal moment in both Dylan's career and the history of folk music and rock'n'roll. Because of a mislabeled bootleg, the concert would forever be known as The Royal Albert Hall Concert—which is where, in November 2022, Chan Marshall, aka Cat Power, recorded this ardent recreation.

Singing the concert's 15 songs in their original running order, Marshall—who has said "Dylan is a deity to all of us who write songs"—is accompanied, as in the original, first by only her guitar and later by a band.

While comparisons to Bob loom throughout—comparisons unlikely to work in her favor—these versions, faithful in arrangements and spirit to the original, work for two reasons. Like Dylan, her voice is thin and shaky but expressive in its struggles. Also, throughout, she's clearly feeling this music. There's a joyous energy when she and the band break into "Tell Me, Momma." Her interpretation of "Just Like a Woman," backed by Aaron Embry's harmonica, works beautifully. And while she has obviously studied the vocal inflections and pacing of Dylan's original show, having a female voice on tunes like "Leopard-Skin Pill-Box Hat" adds a refreshing new flavor.

While this will never challenge or even approach the brilliance of the original, it is an intriguing refraction of that show, with truly great live sound. It pays profound respect to one of the pivotal moments in the career of the greatest of all singer-songwriters.—**Robert Baird**

JAZZ



ADAM BIRNBAUM
Preludes

Birnbaum, piano; Matt Clohesy, bass; Keita Ogawa, drums

Chelsea Music Festival CMF-L2301 (CD). 2023. Birnbaum, prod.; David Stoller, eng.

PERFORMANCE ★★★★★
SONICS ★★★★★

The best way to encounter this record is to come upon it unawares, perhaps online or on the radio. Start grooving to its infectious beat, then you say, "Wait! Isn't that *The Well-Tempered Clavier*? Is this Bach or is it jazz?"

It is exactly both. Bach has long exercised a pull on jazz musicians. John Lewis, Brad Mehldau, Uri Caine, Leszek Możdżer, Jacques Loussier, and Dan Tepfer are among the jazz pianists who have taken swings at Bach. Add Adam Birnbaum to the list. *Preludes* contains selections from *The Well-Tempered Clavier, Book 1*. It just might be the best Bach/jazz album yet. It is definitely the most fun.

Birnbaum's achievement is to deeply embed the spirit of Bach in a high-flying jazz trio without compromising either. It is paradoxical but true that Baroque music and jazz are compatible. It is known that Bach embraced improvisation. His elemental forms contain spaces that invite interpretation. Birnbaum takes varied approaches to these opportunities. Sometimes, as on "Prelude in E major," his arrangement is close to the basic jazz format of head-solos-head. The gorgeous theme is released into an improvised solo of surprisingly commensurate lyricism, then is restated at the end. On "Prelude in C minor" he retains Bach's left-hand part but invents an alternative melody with his right. Bach's chord progressions often set up Birnbaum to get his bebop on. "Prelude in C major" is the simplest and most famous of these iconic pieces. Birnbaum, dancing across the changes, turns it into cool, quick jazz and sounds natural doing it.

Speaking of dancing, Birnbaum's collaborators, bassist Matt Clohesy and drummer Keita Ogawa, are pure grace. With their light but insistent touch, they swing Bach like crazy. The overriding impression of *Preludes*, even more than its competence and creativity, is its joy.—**Thomas Conrad**

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JAZZ

SIMÓN WILLSON
Good Company

Willson, bass; Jacob Shulman, tenor saxophone; Isaac Wilson, piano; Jonas Esser, drums

Fresh Sound New Talent FSNT 659 (CD). 2023. Jacob Shulman, prod.; David Stoller, eng.

PERFORMANCE ★★★★½
SONICS ★★★★½

The back story for this album is unremarkable. Simón Willson is one of the countless jazz musicians in New York who is from somewhere far away. He came to the United States from Chile in 2011 to attend the New England Conservatory and stayed. He is not well-known outside the inner circles of the New York scene, but he is a respected sideman and has played bass with Dave Douglas, Ethan Iverson, and Jason Palmer.

Talented sidemen eventually make their own records. If Willson's history is typical, his debut album is not. *Good Company* is exceptional. The other members of Willson's band (listed above) are, at this moment, even less famous than he is. But each is a creative free thinker who practices discipline.

Ten varied, engaging Willson compositions showcase the breadth of artistic aptitudes contained within this ensemble. On "Being on Time," the quartet collectively, vividly renders a plaintive melody. Then pianist Isaac Wilson and tenor saxophonist Jacob Shulman trade it back and forth, intensifying the emotion with each pass. "No More X" is a beautifully spilling, sprawling piano feature that Shulman and drummer Jonas Esser crash into and ignite. "Gracious" is a rapt ballad with hard edges. So is "Calma." It barely contains Shulman's passion.

On every track, you feel the shaping influence of Willson. He leads this band from within. His rich, deep bass lines are woven all through the music, as unifying threads. His group of volatile improvisers creates within his organized arrangements, plays with concision, and wastes few notes. The most concentrated track is "My Respects," a three-minute, through-composed "elegy for victims of injustice." No one solos, but within its tight structure, everyone discovers and conveys his own empathy.—**Thomas Conrad**

JOSHUA REDMAN
Where Are We

Redman, tenor saxophone; eight others

Blue Note B003766502 (CD, available as LP). 2023. Redman, prod.; Chris Allen, eng.

PERFORMANCE ★★★★½
SONICS ★★★★★

In jazz, when someone signs with the Blue Note label, it means that artist has arrived. Joshua Redman's Blue Note debut is billed as "his first-ever vocal project." The singer here, Gabrielle Cavassa, is a star-in-waiting. The rest of Redman's new, badass band is pianist Aaron Parks, bassist Joe Sanders, and drummer Brian Blade.

Cavassa's presence puts Redman in an unfamiliar role: accompanist and interlocutor. His powerful, articulate tenor saxophone still gets prime time, but the need to support a singer imposes a new concentration and economy on his playing. He makes every note count. He has never sounded more focused.

The songs touch down on places that span the United States, in a meditation on our society's current moment. Tunes are often reimagined as blends. "Stars Fell on Alabama" is interwoven with "Alabama," John Coltrane's dark, brooding ballad. Redman's own "After Minneapolis" contains a saxophone solo that is a searing, shrieking protest and lament for the atrocities committed in that city. The song's meaning is enlarged by combining it with Woody Guthrie's "This Land Is Your Land." Tony Bennett's sentimental hit about "the city by the bay" has Monk's "San Francisco Holiday" embedded in it, which hardens it.

Redman brings in four prominent guests, one for each track. Kurt Rosenwinkel, Peter Epstein, Joel Ross, and Nicholas Payton all sound inspired on tunes associated with their native cities.

For many, the revelation of this album will be Cavassa. Her voice gets under your skin. It is idiosyncratic, but it is trustworthy in its clarity and almost physical in its intimacy. Even on relatively straightforward pieces like "By the Time I Get to Phoenix," her intuitive interpretations and riveting voice make you sit very still in your chair.—**Thomas Conrad**

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CLASSICAL

WEINBERG
Dawn, Op.60, Symphony No.12, Op.114

BBC Philharmonic, John Storgårds, cond. Chandos 20165 (CD, reviewed as 24/96). 2023. Brian Pidgeon, Mike George, prods.; Stephen Rinker, eng.

PERFORMANCE ★★★★½
SONICS ★★★★½

Warsaw-born Mieczysław Weinberg, whose parents worked in the Yiddish Theater and died in a Nazi concentration camp, began a close friendship with Shostakovich. Citing their meeting as the time his life was born anew, Weinberg shared with Shostakovich a history of persecution by Soviet authorities. Shostakovich championed Weinberg's work and interceded on his behalf after his arrest in 1953 on charges of "Jewish bourgeois nationalism."

As much as Weinberg was his own man stylistically, many of his works reflect the strong influence of Shostakovich and other composers. The 17-minute *Dawn*, dedicated to the 40th anniversary of the Russian Revolution of 1917, was composed in 1957 during the same months that Shostakovich wrote his shattering Symphony No.11 "The Year 1905." Perhaps the reason *Dawn* received its posthumous premiere in 1919, when Storgårds conducted it with the BBC Philharmonic, is that it possesses a far milder symphonic language that fails to establish a truly unique voice. *Dawn*, though, has extended passages of beauty, engaging sections of conflict, and a 55-second victory-celebration conclusion virtually obligatory at the time and place.

Weinberg began his Symphony No.12, "In memoriam Dmitri Shostakovich," 18 years later, shortly after Shostakovich died. It's far more original and compelling. The Twelfth's 20-minute opening movement begins emphatically with multiple exclamation points that, to me, evoke the big, strong steps of a marching battalion. Beyond its eerie passages and militaristic clashes lie deep sadness. Militarism reasserts itself in the horn procession at the start of the second movement *allegretto*. Shostakovich's influence arises in subsequent circus-like, macabre passages, but the symphony's somber conclusion is as unique as it is haunting.—**Jason Victor Serinus**

NIELSEN
Violin Concerto, Flute Concerto, Clarinet Concerto

Bomsori, violin; Ulla Miilmann, flute; Johnny Teyssier, clarinet; Danish National Radio Symphony/Fabio Luisi

Deutsche Grammophon (downloadable WAV files)

PERFORMANCE ★★★★½
SONICS ★★★★★

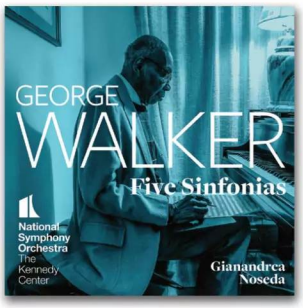
Hearing Nielsen's three concerti cheek-by-jowl points up the composer's "tics": the short motifs building into larger structures; the back-and-forth ostinatos; the little woodwind duets. In all three scores, the reigning turbulence will suddenly melt into repose only to work back into a lather shortly afterward; when extended cadenzas arrive, they feel "too early." The style is both more advanced and more accessible than, say, late Sibelius.

The Violin Concerto offers few flashy display opportunities but requires formidable technique and musicianship. The performance reveals its stature and substance. The luminous soloist, Bomsori, soars lyrically above the orchestra and brings the cadenza-like passages a rhapsodic spontaneity. Wind colors are lovely, particularly the searching oboe and velvety horn.

In the Clarinet Concerto, Teyssier produces a suave tone, infusing the first movement's outbreaks and flourishes with panache and the right amount of "crazy," starting the cadenza with haunting subtones and riding deftly over the *Poco adagio*'s whirling strings. The Flute Concerto is a letdown: Miilmann's crisp, clear tone takes on an appealing, chiffy warmth in the lows, but the second movement keeps losing momentum and the through-line.

Fabio Luisi has done well by DG's Nielsen cycle, though with quirks. In the Violin Concerto's *Poco adagio*, the accelerating triplets sound oddly Italianate. The Danish strings are lovely, though their handoffs with the violin soloist are diffuse, and the high *divisi* that concludes the Clarinet Concerto doesn't shimmer.

The warm ambience enhances Bomsori's glowing tone as she rides above the ensemble, without clouding detail. On Teyssier's close-miked clarinet, we can hear his embouchre changes.—**Stephen Francis Vasta**



WALKER
Sinfonias 1–5

National Symphony Orchestra/Gianandrea Noseda NSO0007 (CD). Blanton Alspaugh, prod.; Mark Donahue, eng.

PERFORMANCE ★★★★★
SONICS ★★★★★

I first encountered George Walker in the old Columbia Black Composers series, via a knotty, persuasive Trombone Concerto and an ambivalent *Lyric for Strings*. Noseda and company now introduce his five *Sinfonias*, spanning 1986–2016.

Walker, an avowed modernist, cited Hindemith and Stravinsky as inspirations, so his dissonant, hard-edged style should surprise nobody. It's difficult to recognize any of the movements as sonata forms, however. It's left to rhythmic repetition and momentum to generate coherent shapes.

Once past Sinfonia 1—whose ominous textures and harmonies recall 1960s TV scores—there's much to engage. In the Second, a rough start fades to lighter, contrasting textures and plaintive sustained winds, which the strings expand with intense richness; an extended flute solo, handsomely shaped and nuanced, introduces the second movement. The Third is introduced by turbulent block sonorities and doesn't immediately calm down. The agitated finale is sure-footed.

The last two sinfonias perhaps are the most satisfying. The Fourth, subtitled *Strands*, gets off to a gripping, forceful start, nodding strongly at tonality; there's even a melting cello solo set up by a sustained-wind "pyramid." Two spirituals are quoted; the booklet cites Ives's influence, but "A Balm in Gilead," distributed among various instruments, is more pointillist. The Fifth, *Visions*, is no more starkly modernist than the rest, though, inspired as it was by the 2015 Charleston shooting, it maintains a harsh tone, occasionally broken by reflective bits of Coplandesque Americana. Three vocal soloists don't sing but rather recite and declaim.

The full-bodied, rhythmically astute National Symphony, recorded live, has never sounded better; the vivid sonics offer depth and precise placement.—**Stephen Francis Vasta**

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RE-TALES

BY JULIE MULLINS

THIS ISSUE: Conversations with US and Italian hi-fi manufacturers show that there are advantages to working with local and regional suppliers.

Keeping it local

To remain profitable, many hi-fi companies have outsourced production to faraway countries with lower labor costs. That, certainly, is a legitimate way of doing business. Yet many other hi-fi makers have chosen to work with suppliers that are local, regional, or at least domestic. There are good reasons for doing so, those manufacturers maintain.

Some of the advantages are obvious. Local labor may cost more, but shipping what they make is much cheaper. Cost "is only one of the factors to account for when designing and manufacturing complex objects such as a turntable, a loudspeaker, or a streaming DAC—but it's often what companies and customers focus on," Gold Note Sales and Marketing Manager Tom Dolfi and CEO/Founder Maurizio Aterini wrote in a joint email response to questions. In a perfectionist industry like this one, quality is a huge consideration. Response time matters, too. Those advantages came to the fore during the pandemic, when supply chains failed and shipping slowed way down and got expensive, as reported in prior Re-Tales columns.[1]

McIntosh Labs manufactures many products in its factory in Binghamton, New York. The vertically integrated company does more than stuff circuit boards there; it manufactures parts in-house, from output transformers to the magnet wire used to wind them. They also stamp, cut, and form sheet metal. In a recent telephone conversation, McIntosh Group CEO Charlie Randall noted that while many companies have shifted toward overseas suppliers, it doesn't always make sense.

"We're not a small manufacturer and not a huge manufacturer," Randall said of McIntosh. For such a company, moving production to China (for example) may be tempting, but it can be difficult to control quality at big overseas factories. And while labor costs are cheaper overseas, the cost savings don't always add up. McIntosh may be able to save 10%, he told me, but only if they buy in bulk—often a year's worth of product or more—which carries significant costs and risks. Plus, with higher import duties, "all that cost savings would have been eaten up anyway."

Much extrusion work is done in China, for McIntosh as for other companies—but extruded products are often large and heavy; companies must factor in the cost and speed of shipping. Shipping by air is expensive, while shipping by sea from Asia can take 45 days or longer. Aside from the costs borne by the company, overseas production has environmental costs—fossil fuels propel jets and ships—and social costs in the form of displaced workers.

In Europe, it's common for manufacturers to work with regional suppliers.

Working with local suppliers removes so many barriers and enables a whole new level of collaboration."
—TOM DOLFI, GOLD NOTE

Long-term relationships are often easier to foster and maintain with suppliers who are closer to home, whether they're just down the road or a short drive or train ride away. Many of Gold Note's suppliers are located within an hour's drive of their Tuscany headquarters. Proximity fosters strong partnerships. "Proximity is the ultimate advantage," Gold Note's Dolfi said. "We make physical objects, not software, so it's crucial for us to be able to speak with our suppliers as frequently as possible."

McIntosh also has local suppliers, at least one within walking distance. As a result, "We get to control the quality better. We can have people at that facility every day," Randall said. "For the most part, we try to do things as local as we can. ... Some of that stuff you just can't do by Zoom."

With a strong local partnership, a supplier can become a collaborator. "We can easily pay [a local supplier] a visit to quickly assess the quality of materials, discuss alternative options, and listen to their feedback," said Gold Note's Dolfi. "Proximity is not just about distance but also language, time, and culture. Working with local suppliers removes so many barriers and enables a whole new level of collaboration."

Local suppliers are often more flexible, more willing to adapt to manufacturer needs. "We use walnut hardwood for the plinth of our turntables and, thanks to our supplier [nearby], we have been recently moving to a new type of coating that's 100% eco-friendly," Dolfi said. "Their feedback and expertise guided us through the whole project, and we were able to quickly test, review, and iterate the process."

Such rapid iteration can be a big advantage, especially in R&D. "Everything's always down to the last minute, especially when you're developing a new product. Then all of a sudden, you find out you've got to make a change," Randall said. He mentioned a specialty manufacturer in New England that "bends over backwards" for them, delivering modified parts, in limited quantities, in as little as three days.

Being close to home is especially an advantage when mistakes are made. Bartolomeo Nasta, export manager for Opera and Unison Research, described a past situation with a faraway supplier that shipped his company defective items. They returned the products, then had to wait for a new batch to be made. The process took four months from the first order confirmation. "If something like that happened in Italy, we could solve it in less than half the time," Nasta wrote in an email. "Most of the parts we use now are made and sourced regionally, from Italy mostly but also from Europe."

Massimiliano Marzi, CEO of Audia Company (Audia Flight, Alare), reported a recent case of local advantage. When they began production on the Audia Flight FLS20 SACD player, they realized they'd sent a supplier incorrect information. "After we verified our error, we sent back the items to make a modification. It was so fast: We received the items with correction in one week."

Gold Note's suppliers have grown with them to become long-term partners. Some of McIntosh's supplier relationships go back more than 40 years, Randall told me. Utilizing local suppliers is ultimately about relationships—relationships that are profitable but that also transcend profits. "I believe suppliers are the true treasure of any company," Marzi said. ■

1 See tinyurl.com/mry98vdr and tinyurl.com/yktrf7wz.

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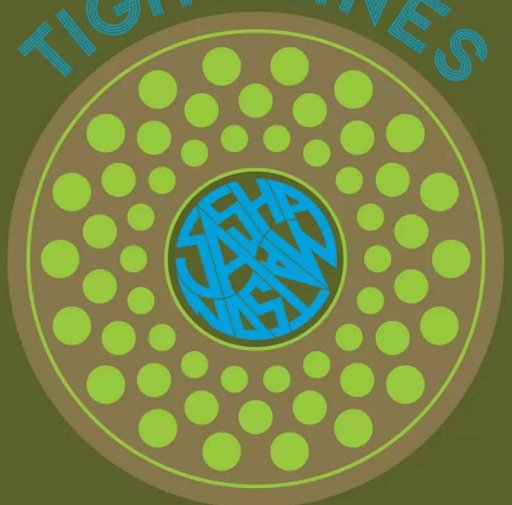

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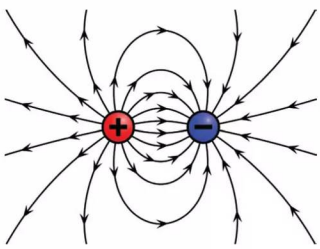

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MANUFACTURERS' COMMENTS

THIS ISSUE: Representatives of Mobile Fidelity, Q Acoustics, Naim, and Plinius respond to our reviews of their products.

Mobile Fidelity Electronics MasterPhono

Following a hugely successful AXPONA 2023 show, we were elated when Herb Reichert requested a MoFi MasterPhono for his Gramophone Dreams column. What could be better than a master storyteller like HR getting his hands on MoFi Electronics's new statement product? The MasterPhono is a highly complex component that requires patience to fully comprehend and "dial in" to achieve maximum performance from one's phono cartridge(s), which makes it perfect for the Gramophone Dreams column. We would like to take this opportunity to further clarify a few aspects of HR's excellent and thorough editorial.

The included, sculpted-aluminum remote control does indeed do a whole lot more than turn the meter lights on and off. Adjustments to cartridge loading, gain, mode (Stereo/Mono), and subsonic filtering are all facilitated via the remote. Being able to easily and accurately dial in your phono cartridge from the comfort of your listening position is a convenience that cannot be overstated. Once you try it, there's simply no going back. Most listeners will find this invaluable.

The latest software update, version 1.4.3, allows for a new TEST MODE 3, using the HiFi News Test Record (HFN001) to achieve proper azimuth setup, exactly like TEST MODE 2 using the Analogue Productions AAPT1 disc.

We appreciate Herb's comments on the performance of the "current input" using the Dynavector XX2 MKII, which is no doubt an excellent cartridge. The transition range where the "current input" should be used vs the "voltage input" is suggested as 10 ohms. This is not a hard number but a broad area that requires experimentation. We have compared many cartridges with the two inputs and concluded that for current input, lower is better. As you get down to the 1–2 ohm range (My Sonic Labs or Lyra Atlas λ Lambda products), "current input" becomes a definitive improvement. Experiment to find the best results.

If you are ready for a phono stage of this caliber, we strongly suggest you look to the MoFi Electronics MasterPhono first.

Peter Madnick,
Senior Product Development Engineer
Lionel Goodfield,
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MoFi Distribution

Q Acoustics 5040

Q Acoustics has always set out to provide great value with our products, and we're delighted that John has recognized this, first with the Concept 50 and now the 5040 from our all-new 5000 Series. It's refreshing in this decade to see such a thorough and detailed review, both in measurement and performance, and that the 5040 matches and lives up to its superior specifications. To simply say that the 5040 "offers superb sound quality" is an accolade indeed, which we greatly appreciate, especially when coming from such a respected source. A warm thank you to John and all at *Stereophile* for featuring us.

Alex Munro, Brand Director
Q Acoustics

Naim NSC 222 and NPX 300

The NSC 222 is more than simply the successor to the NAC-N 272; it has become our benchmark for high-quality preamplifiers with built-in streamers. NSC 222 delivers audiophile performance across ancillary source components, including high-quality moving magnet–equipped record players, with of course the streaming section worthy of the most discerning music listeners.

The solid backbone to all Naim components is the power supply. The NPX 300 offers the best performance to Naim source components and preamplifier. The addition of a better external power supply to the NSC 222 delivers its full potential, elevating it to greater heights of musical performance. Power supplies never cease to amaze and will remain a key player in our range of products.

Jason Gould, Brand Ambassador
Naim Audio

Plinius Reference A-150

I would like to thank the *Stereophile* team, with kudos to Jason Victor Serinus, Jim Austin, and John Atkinson for their professionalism on this project. Because of the wide price range of products that come under review, placing an amplifier in the $15,000 price range against higher priced models can be difficult. While I can appreciate Jason's vast experience with many high-priced models and how these products interact with the Wilson Alexia V, overall, the RA-150 fared very well, especially when used in a monoblock configuration. I liken the listening experience to driving a high-performance Ferrari, then driving a modern family sedan. The Ferrari is light-years ahead in all aspects of acceleration, handling, and braking, but today's sedans are very acceptable especially when value is considered. The Plinius Reference A-150 excels against many of its competitors in its price range. I personally interact with many current Plinius customers who own prior SA Class-A models, the predecessor to the RA series, and are very happy with the performance of these products. My own system consists of a pair of Vienna Acoustics Haydn Signature speakers and the RA-150, which brings me immense listening joy and pleasure. (Yes, I'm biased.) One could spend a lot more on a system, but how much more audio pleasure would one experience for the money? I understand that audio excellence is the goal of the audiophile world, but value is also an important consideration.

The Reference A-300 may be an even better match when paired with the Alexia V. Hopefully, I can work with the *Stereophile* team on a review of this model in the future. In the meantime, I am pleased that we can offer the Plinius RA-150 as an excellent value alternative to the average audiophile.

Ralph Abramo
Plinius Audio US Distributor

MY BACK PAGES

BY HERB REICHERT

THIS ISSUE: Listening to Tony Rice with Art Dudley's ghost.

The truth will make you odd

In Gramophone Dream #79, I described how my mother started me on a path where I am compelled to look and touch and listen and read my way to "good taste in everything." "Books and manners," she called it. She viewed these social proficiencies as something people put on like clothes.

But for me, taste has a deeper significance. I see it as regulated by an internalized moral and socio-spiritual code that forces me to recognize how little I know about whatever subject I am judging. With fine art and music, that code compels me to ask myself *why* I prefer one artist, style, or genre to another. This why-oriented introspection is important because when I take this type of inventory, it is easy to see how much a lifetime of experiences—drugs, deejays, hot rods, unruly girls, and my cohort of white suburban buddy-pals—have influenced my taste in everything, especially cars and music.

Recently I've been thinking a lot about the late Art Dudley and how Art worked humbly and relentlessly to get me to appreciate contemporary bluegrass, especially the work of renowned flat-picker Tony Rice. Back then, my contempt for contemporary bluegrass was equal to my contempt for contemporary country. Both seemed faux and shallow.

Even after reading Art's 2016 article for *Fretboard Journal* entitled "58957,"[1] wherein he tells the fantastic story of Clarence White's—then Tony Rice's—"big hole" Martin D-28 guitar, I wasn't convinced. I loved Art, so I kept trying to grasp Mr. Rice's virtues, but I kept seeing him as a cool-minded technician, admired by legions of aspiring flat-pickers not as a high-lonesome minstrel like Carter Stanley or Doc Watson but as a man with talented fingers. And then there was the mullet issue: My mother never approved of mullets. I did not listen long enough or sincerely enough to recognize the high levels of expressive power I perceive in Tony Rice now.

I recognized the scope of my error while watching a YouTube video of two young bluegrass artists, Billy Strings and Molly Tuttle, playing "Blue Railroad Train," the famous Delmore Brothers' song from 1934. This popular bluegrass anthem has been covered by (among others) Doc Watson, Jorma Kaukonen, and Tony Rice, but I never gave Rice's version an honest listen—until last night, when the Ghost of Art D sat next to me watching videos in my darkened room. Art guided me through a long, slow, *respectful* listen that took my mind out of its iron cage and showed me the depth of Rice's feeling and the height of his musical achievement.

As I sat in the dark with vaporous Art, I realized that Tony's mullet was more like a declaration of independence than a fashion fail. With Art at my side, it was easy to see what I never saw before: the transcendent levels of humble sentiment expressed in Rice's performance of "Blue Railroad Train." That video[2] showed me that Tony's pickin' was more church than circus. His version conveyed the reverent spirit of traditional bluegrass combined with his own unique and authentic cultural identity. Finally, I saw that Rice's style was integral and essential to his music's artistic effect, like Lou Reed's or Björk's to theirs. Tony Rice may not be authentic high lonesome (or high fashion), but he *is* high sentiment, and that's all any picker needs to sit close to God or at least be loved by me.

While listening to Tony with ghost-Art, I realized how my previsitation bluegrass taste was really a form of *I'm more authentic than you* snootiness. Now I see how Art's appreciation of Rice came from his own more holistically engaged pursuits. Art had seen him perform live, had studied Tony's licks, and had a framed photo of his wife, Janet, backstage with Tony. I regret that my snootiness prevented me from sharing the thrills of Tony's preternatural picking with Art while he was still alive. We could have seen Rice play live together. Art would have introduced me. I could have asked Tony if bluegrass's frantic rhythms are really based on hounds chasing frightened rabbits.

Even as a teen, I knew that shared taste in "things" and shared musical experiences are social catalysts and human bonding agents. But only now do I understand that if I listen with respect and patient attention to any music I'm convinced I don't like, I will likely change my mind.

One morning sometime after Art's passing, I was reading a Flannery O'Connor short story and stopped abruptly, saying "Whoa!" As I was reading, I realized that Flannery wrote an awful lot like Art. The resemblance was so strong that I immediately texted Janet and asked her if Art was a fan of Flannery O'Connor. She told me that visiting O'Connor's childhood home in Savannah, Georgia, was the last trip they took together. Janet sent me a souvenir bumper sticker with images of two peacocks and Flannery O'Connor's famous quote, "You shall know the truth and the truth shall make you odd."

When I meet up with Art on the other side, those will be the first words out of my mouth, whereupon we'll both laugh and scream like teens in praise of our favorite storyteller. Then I'll ask Art if he remembers watching Tony Rice videos with me. ■

1 See fretboardjournal.com/features/58957-tony-rice-and-his-holy-grail-martin-d-28.

2 See youtube.com/watch?v=0a5qBz03Ycs.

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